

East Face Vegetation Management Project

Wildlife Specialist's Report

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INTRODUCTION

This analysis described the terrestrial wildlife species found in the project area and the effects of the alternatives on these species. Rather than addressing all wildlife species, discussions focus on Forest Plan management indicator species (MIS); threatened, endangered and sensitive (TES) species; Forest Plan featured species; and landbirds. The existing condition is described for each species, group of species, or habitat. Direct, indirect and cumulative effects of alternatives are identified and discussed. Supporting wildlife documentation is located in the Project Record, and includes detailed data, methodologies, analysis, conclusions, maps, references and technical documentation used to reach conclusions in this environmental analysis,

MANAGEMENT INDICATOR SPECIES (MIS)

The Wallowa-Whitman National Forest Land and Resource Management Plan (LRMP) identifies five wildlife species, or groups of species, as MIS, or Management Indicator Species (U.S. Forest Service, 1990). These species are identified because of their special habitat needs that may be influenced significantly by planned management activities, and as a result their populations can be used to indicate the health of a specific type of habitat. MIS species welfare can be used as an indicator of other species dependent upon similar habitat conditions.

Table 1 - Wallowa-Whitman National Forest Management Indicator Species

Management Indicator Species	Habitat	Presence Within Analysis Area
Rocky mountain elk	Cover and forage	Yes
American marten	Old growth and mature forest	Yes
Northern goshawk	Old growth and mature forest	Yes
Pileated woodpecker	Old growth and mature forest	Yes
Primary cavity excavators*	Snags and logs	Yes

* Northern flicker; black-backed, downy, hairy, Lewis', three-toed, and white-headed woodpeckers; red-naped and Williamson's sapsuckers; black-capped, and mountain chickadees; and pygmy, red-breasted, and white-breasted nuthatches

Rocky Mountain Elk

Rocky Mountain elk have been selected as an indicator of habitat diversity, interspersed of cover and forage area, and security habitat provided by areas of low human disturbance. Elk management on the Wallowa-Whitman National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife (ODFW). The Forest Service manages habitat while ODFW manages populations by setting seasons, harvest limits, and goals for individual Wildlife Management Units (WMU). The East Face project lies within the Starkey WMU.

Potential elk habitat effectiveness may be evaluated using the Habitat Effectiveness Index (HEI; Thomas et al. 1988). This model considers the density of open roads, the availability of cover habitat, the distribution and juxtaposition of cover and forage across the landscape, and forage quantity and quality. More recently, Rowland et al. (2005) has proposed the use of distance band analysis (DBA) to better understand the effects of roads on elk security habitat.

Background Information

Rocky Mountain elk (*Cervus canadensis nelsoni*- hereafter elk) are an important big game species in northeastern Oregon (Csuti et al. 2001) and are an indicator of the quality and diversity of forested habitat (defined as $\geq 40\%$ canopy closure, USDA LRMP 1990) which includes an interspersed cover and forage areas, and security habitat provided by cover and low levels of human activity (Thomas 1979). It is commonly accepted that the other big game species (i.e. mule deer, white-tailed deer, black bear, and cougar) are at least partially accommodated when high quality elk habitat is present. Elk are habitat generalists; they exploit a variety of habitat types in all successional stages and their patterns of use change daily and seasonally (Toweill and Thomas 2002). Optimal calving habitat is gentle terrain with plenty of succulent vegetation less than 1,000 ft from water, with an abundance of low shrubs or small trees under an overstory with a $\geq 50\%$ canopy closure (Thomas 1979). Elk are quite responsive to land management activities, thus the density or health of elk populations (as opposed to examining population trends) most likely indicate the effectiveness of elk management. (Toweill and Thomas 2002).

Logging generally results in increased elk forage, with declines in the short term (1-3 years), followed by large increases in forage that may last 10 years or longer (Wisdom et al. 2005b). Large-scale habitat manipulations are being conducted with increased frequency in western forests, and although fuels reduction via thinning or prescribed burning often is assumed to benefit wildlife (Toweill and Thomas 2002, Wisdom et al. 2005a), based on the interacting effects of fuels reduction and season on forage characteristics, Long et al. (2008) suggests that maintaining a "mosaic of burned and unburned forest habitat may provide better long-term foraging opportunities for elk than burning a large proportion of the stand on a landscape."

Displacement of elk from areas during human activities (e.g. logging, fuels reduction) is well documented (Edge 1982, Toweill and Thomas 2002, Wisdom et al. 2005a). Under most cases, this displacement is temporary, and there is no evidence that elk will not eventually return to harvested areas (Toweill and Thomas 2002). Of much more concern to resource managers are the establishment of roads associated with harvest activities that increase accessibility to recreationists (e.g. hunter, hikers, cross country skiers, OHV). Increased road use by recreationists has been shown to significantly reduce elk security (Toweill and Thomas 2002), increase stress levels (Creel et al. 2002), and increase elk vulnerability to mortality from both legal and illegal hunter harvest (Rowland et al. 2005).

Blue Mountain/WWNF Population Viability

The National Forest Management Act (1976) requires that habitat exist to provide for viable populations of all native and desired non-native vertebrates. Elk is a game species that is managed on a management objective (M.O.) basis. Management objectives were developed to consider not only the carrying capacity of the lands, but also the elk population size that would provide for all huntable surplus, and tolerance levels of ranchers, farmers, and other interests that may sometimes compete with elk for forage and space. Biologically, a population that is managed around a M.O. is much larger than a minimum viable population. A minimal viable population represents the smallest population size that can persist over the long term. Historically

there were game species, including elk, which warranted serious conservation concerns due to depressed populations and range contractions resulting from unregulated market and sport hunting and loss of habitat. Many of the factors that contributed to the decline of large wild ungulates in the past do not exist today. Currently, elk populations on the WWNF are regulated by hunting and predation. Elk numbers are substantially higher than what would constitute a concern over species viability.

LRMP standards and guidelines

The FS land management allocations MA1, MA1 W, MA3, and MA3A emphasize timber production, but timber management is designed to provide near-optimum cover and forage conditions for big game. The LRMP gives big game standards by MA for cover, open road density, and habitat effectiveness (HEI) (Table 2)

Table 2 - Standards for big game habitat by MA (U.S. Forest Service 1990)

Habitat measure	MA 1	MA 1W	MA 3 (Winter Range)	MA 3W (Summer Range)
Cover₁	≥ 30% cover	≥30% cover	No numerical standard in the LRMP, but it states "...to provide near-optimum cover and forage conditions for big game" ₂	No numerical standard in the LRMP, but it states "...to provide near-optimum cover and forage conditions for big game" ₂
HEI value	≥0.5	≥0.5	Long-term average of 0.74	Long-term average of 0.74
Open road density	≤ 2.5 mi/mi ²	≤1.5 mi/mi ²	≤1.5 mi/mi ²	≤1.5 mi/mi ²
Distribution of cover	N/A	N/A	At least 80% of the treated area that converts cover to forage is to be within 600 ft of a satisfactory cover patch at least 40 acres in size	At least 80% of the treated area is 1) w/in 600 feet of a satisfactory or marginal cover patch at least 6 acres in size and 2) w/in 900 feet of a satisfactory cover patch at least 40 acres in size

₁Cover refers to any combination of satisfactory cover (a stand of coniferous trees with >70% canopy closure) and marginal cover (a stand of coniferous trees with 40-70% canopy closure). The optimum elk habitat ratio is approximately 40% cover to 60% forage (Thomas 1979)

₂A ratio of 40% of a landscape in cover to 60% in forage approximates optimum habitat in the Blue Mountains (Thomas 1979). A "near-optimum" ratio would resemble the ≥ 30% cover standard for MA1 and 1W.

Existing Condition

The East Face project area falls within the Starkey WMU (ODFW) contained within the Umatilla-Whitman Province. Elk populations in the province increased from about 7,500 in the late 1960's to about 19,000 in the mid-1970's. Populations have remained between 15,000 and 20,000 ever since. The Starkey unit has remained fairly stable over the years. In 2001, elk numbers were about 116% of the management objective of 17,100.

The Forest Plan establishes standards for wildlife habitat, and more specifically elk habitat on the Forest. The East Face analysis area provides year round habitat for big game, though winter range and summer range are minimal; 996 acres of MA-3 (wildlife/timber emphasis- big game winter range) lies along the eastern/center edge of the analysis area. 35,051 acres is designated MA-1 (Intensive timber management) and covers the majority of the project area. 3,687 acres is designated MA-3A (wildlife/timber emphasis- big game summer range) and lies along the

eastern portion of the analysis area. High security habitat is provided within the north eastern and south eastern/central portions of the analysis area due to limited motorized access and seasonal closures.

The East Face project area was analyzed using a habitat effectiveness model (Thomas et al. 1988) to assess the quality of elk habitat. The HEI model evaluates size and spacing of cover and forage areas, density of open roads, quantity and quality of forage available to elk and cover quality. Forage data is unavailable and is not included in the total HEI value. To further examine security habitat for elk, a distance band analysis (DBA) was performed as described by Rowland et al. (2005), and a separate HEI value was calculated (Table 3). DBA calculates the percent of the analysis area from varying distances from open motorized routes. HEI was analyzed at the project level, which is approximately 47,600 acres.

Cover: Forage Ratio – A cover: forage ratio is used to describe the relative amounts of cover to forage and while the optimal ratio of cover to forage is 40:60 (Thomas 1979), the LRMP establishes a minimum standard that at least 30% of forested land be maintained as cover (>40% canopy closure). “Forested land” refers to only those acres that currently provide forested cover or have the potential to provide it, not to grassland, shrub steppe, rock, or bodies of water. Cover refers to any combination of satisfactory cover (a stand of coniferous trees with >70% canopy closure) and marginal cover (a stand of coniferous trees with 40-70% canopy closure). Forage habitat has less than 40% canopy cover.

The existing cover: forage ratio is 71:29. This ratio exceeds the LRMP standard, suggesting a high surplus of cover, however stand data was collected in the early 80's and the ratio may misrepresent the analysis area based on changed conditions due to natural disturbances over time.

Cover Quality – Forests stands with relatively closed canopies function as thermal and security cover, providing a visual barrier from predators, and may reduce the effects of ambient temperature, wind, and long and short wave radiation functions on energy expenditure (i.e. increased metabolic rates) in elk. Although the benefits to elk of “thermal cover”, in the true sense of the word, has been questioned (Cook et al. 1998, Bender and Cook 2005), the intent of the standard in managing elk habitat remains credible in that habitat attributes can be influential to energy balances by affecting forage quality and quantity, and mediating energy expenditures associated with travel and harassment (Bender and Cook 2005). By implementing the current “thermal cover” standard, resource managers are also providing needed barriers to minimize the negative effects of human disturbance.

The Wallowa-Whitman LRMP establishes a minimum standard for big game thermal cover (marginal and satisfactory combines). At least 30% of the forested lands should be maintained in a thermal cover condition. All Management Areas were pooled for analysis, because they have the same cover standard, thus providing for a more landscape-scale based approach. There are currently 5,685 acres (12.8%) of satisfactory cover, 26,689 acres (58%) of marginal cover and 13,282 acres (29%) of forage habitat within the analysis area resulting in a cover quality value of 0.59 (Table 3).

Size and Spacing – Thomas et al. (1979) suggest that size and spacing of cover and forage habitat is a key to elk use of forested habitat, and this assumption was verified by Leckenby (1984) in the Blue Mountains of northeastern Oregon. Size and spacing of habitat is considered optimal when cover to forage edge widths are between 100-200 yards (Thomas et al. 1988). Considering an HE value of 1 is optimal, an HE size and spacing value of 0.53 (Table 3) indicates that forage to cover ratios within the analysis area is less than optimal, but acceptable. However, this variable is not meant to stand alone and therefore management decisions for providing optimum elk habitat solely based on HE size and spacing value should be used with caution.

Open Roads – Excessive open road densities have deleterious effects on habitat effectiveness by taking land out of production (1 road mile equals 4 acres of land), reducing the effectiveness of cover and increasing disturbance to elk. The existing average open road density within the East Face analysis area is 1.74 mi/mi² (Table 3). 74% of the East Face planning area is designated MA-1 and the average open road density is lower than the forest plan guideline of 2.5mi/mi² for MA-1. However, the road density estimate does not take into account off-road vehicle use on OHV trails, cross-country travel and on closed roads. When these variables are taken into account, road density estimates are likely to be higher.

An important finding from the Starkey Experimental Forest and Range studies is that road (or route) density is not the best predictor of habitat effectiveness for elk. Instead, a method using distance bands proved to be a more useful tool for assessing effects from roads. Road densities do not provide a spatial depiction of how roads are distributed on the landscape (Rowland 2005), but a distance band analysis does. A distance band analysis uses GIS to draw concentric bands around motor vehicle routes until the entire area of interest (in this case the East Face analysis area) is occupied by these bands. The distance band closest to motor vehicle routes (within one half mile) provides the least security for elk. As a result, elk choose to spend less time within one half mile of motor vehicle routes. As distance from motor vehicle routes increases, so does habitat effectiveness for elk. Elk find more security from human disturbance further from motor vehicle routes. The second distance band occupies the area between on-half and one mile from motor vehicle routes, and represents moderate quality security habitat for elk. Effects from motor vehicles begin to dissipate within the second distance band. Finally, effects from roads are nearly negligible within the third distance band that occupies the area greater than one mile from motor vehicle routes. The third distance band represents high to optimal quality security habitat for elk. For this analysis, the percentage of the landscape within each distance band was used as a means of comparing alternatives with regard to the effects of motor vehicle disturbance to elk.

Habitat Effectiveness Index – The Habitat Effectiveness Index (HEI) values are based on a comprehensive elk habitat model developed by Thomas et al. (1988). These values consider the interaction of size and spacing of cover and forage areas, density of roads open to vehicular traffic, forage quantity and quality, and the quality of cover. For this report, HEI values were calculated without a forage quality value because accurate forage data is not available. Roads often compromise the effectiveness of cover. The Forest Plan establishes minimum standards for the overall index. In addition, the Forest Plan establishes minimum standards for retention of total cover and open road density. Excessive open road densities have deleterious effects on habitat effectiveness by reducing the quality of security cover and increasing disturbance. These negative impacts change elk distribution and behavior. The impacts of OHV's on closed roads

and cross country travel are not considered in an HEI analysis, although they likely cause some further reduction in habitat effectiveness. The existing values are 0.58 (road density analysis) and 0.55 (distance band analysis; Table 3).

Table 3 - Habitat-effectiveness index calculations for elk habitat within the East Face analysis area

Habitat Effectiveness Variable	Habitat Effectiveness Value (Optimal = 1.0)	Comments
HE Cover	0.59	Amount of satisfactory cover relative to marginal cover
HE Size and Spacing	0.53	Mosaic of cover and forage, 64:36
HE r value using road density	0.51	Open road density 1.79 mi/mi sq LRMP MA-1 \leq 2.5 mi/mi sq LRMP MA-3/3A \leq 1.5 mi/mi sq
HE r value using distance bands	0.40	Concentric bands around open roads
Total HEI using road density ¹	0.58	LRMP MA-1 \geq 0.5 HEI
Total HEI using distance band analysis*	0.55	LRMP MA-1 \geq 0.5 HEI
Percent of area \geq 0.90 mi from open motorized route*	3%	High quality security habitat

¹ HEI calculations do not include a forage variable because current, reliable forage data are not available

* Habitat \leq 0.90 mi from an open motorized route is considered marginal or poor

Effects

Assumptions

The direct, indirect and cumulative effects analysis area for elk is the East Face project area. This area is over 192 km². The annual home range of an adult elk can be as much as 163 km and so the East Face project area is large enough to support a herd of elk.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on Old Growth resources.

- Roadside hazard tree removal
- Planting, Whipfelling, grapple piling
- Snag Retention
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement
- Mechanical Control Lines for Burning

These activities and their effects will not be discussed further in the effects to Rocky Mountain elk section.

Direct/Indirect Effects for Rocky Mountain Elk

ALTERNATIVE 1 (No action)

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreak would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loading from active management. Assuming no uncharacteristic wildfires or disease/insect outbreaks, deer and elk would likely continue to benefit from dense stands and the landscape would continue to be deficient in forage. If uncharacteristic wildfire or disease/insect outbreaks occurred, the condition of habitat would likely decline due to loss of canopy cover and structural diversity, and then slowly improve over the long-term. The loss of overstory cover would represent a long-term reduction. Deer and elk would lose cover habitat, but would likely benefit from the trade-off of increased forage opportunities. The impact to habitat would depend on the size and severity of the disturbance.

Without disturbance, (e.g. wildfire, insect outbreak), the existing cover: forage ratio (71:29) would not be altered. Current levels of cover would remain and continue to influence elk distribution and movement within the analysis area. This no action alternative would forego opportunities to improve big game habitat including: 1) converting some cover to forage thus transitioning habitat to more closely reflect optimal ratios (40:60; Thomas 1979); and 2) Forage quality and quantity would not be enhanced through prescribed fire (Long et al. 2008). Decadent shrubs and grasses that have been absent of fire for several decades will continue to provide marginal quantities and quality of forage.

ALTERNATIVES 2-5

Cover-Forage

Table 4 displays the HEI model outputs for the East Face project area boundary. All action alternatives would affect elk habitat. Existing conditions show a surplus of marginal cover with forage being a limiting factor. All alternatives will reduce satisfactory and marginal cover (Table 4), but will retain or slightly improve HEI values by improving the forage to cover arrangement (Table 5). All action alternatives meet or exceed LRMP standards for percent cover and HEI. Forest stand tree density reductions from commercial treatments (thinning) with additional prescribed fire treatments would increase available elk forage. The HEI model uses ranges of canopy closure (CC) to identify forage (0-39% CC), marginal cover (40-69% CC), and satisfactory cover (>70% CC). Post-treatment tree densities are expected to be variable, consisting of denser patches interspersed with more open areas, but generally commercial thinning will convert marginal cover to forage. The amounts of forage, marginal and satisfactory cover remaining under each alternative does not reflect the finer scale mixture forage, hiding cover and small marginal cover patches that result from many intermediate commercial thinning prescriptions. Cook et al. (1996) identified forage quality on late summer and fall ranges as an important factor in elk fecundity and juvenile elk growth, and stresses the importance of evaluating forage quality for assessment of habitat quality of these seasonal ranges. A coarse scale elk habitat selection model is currently under development by the Pacific Northwest Research Station (<http://www.fs.fed.us/pnw/research/elk/bluemtns/index.shtml>). This model uses a dietary digestible energy variable, vegetation classes, mean slope and distance to roads to

estimate elk habitat selection (Low-High). This model was run using existing conditions to help identify areas of medium-high use that would benefit from an increase in forage, particularly in summer range. 3,686 acres of summer range exist on the middle - western edge of the project boundary and has been identified as an area that will benefit from forage creation and enhancement. This tool is currently not sensitive enough to identify differences between project alternatives (personal communication, PNW research lab). Alternatives 2, 3, and 5 would create forage within the summer range described above, with Alternatives 2 and 5 creating the most (823 acres) and Alternative 3 creating 544 acres. Alternative 4 would not create any forage within summer range as treatments were either deferred or converted to non-commercial which would not convert cover to forage. Although cover will be converted to forage in all management areas, a high degree of interspersed of forage and cover stands would remain to meet the LRMP direction for cover in MA3 and MA3A.

Table 4 - Summary of Cover Conversions by Action Alternatives (acres)

Indicators	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Satisfactory converted to marginal cover	0	289	93	279	289
Satisfactory cover converted to forage	0	0	0	0	0
Marginal cover converted to forage	0	3,024	2,208	2,618	3,024
Cover converted to forage in MA3A	0	823	544	0	823
Cover converted to forage in MA3	0	157	75	122	157

Table 5 - HEI Variables by Alternative

Alternatives	HE_Cover	HE_Spacing	HE_Road Density	HE_Distance Band	HEI_Road Density	HEI_Distance Bands	Cover/Forage Ratio	% Cover	% Satisfactory Cover	% Marginal Cover
1	0.59	0.53	0.51	0.39	0.58	0.55	71:29	71%	12.8%	58.2%
2	0.59	0.61	0.51	0.39	0.6	0.57	60:40	60%	10.5%	49.9%
3	0.59	0.58	0.51	0.39	0.59	0.57	65:35	65%	11.4%	53.5%
4	0.59	0.61	0.51	0.39	0.6	0.57	60:40	60%	10.5%	49.9%
5	0.59	0.61	0.51	0.39	0.6	0.57	60:40	60%	10.5%	49.9%

Roads

The HEI model developed by Thomas et al. 1998 relies on open road density as an indicator of relative effects from roads on elk habitat. Management areas were pooled because MA3/3A acres only represent 10% of the project area and are not large enough to analyze on their own. Road densities within the project area do not change with the alternatives and stay at marginal levels (0.51) though the actual density (1.74 mi/mi^2) is below Forest Plan recommended levels of 2.5 mi/mi^2 for MA1.

More recent research in northeastern Oregon found that road density is a poor indicator of habitat effectiveness (Rowland et al. 2000). By contrast, the study described a strong linear increase in elk use as distance from roads increased. Therefore, a method using a distance banding approach, as described by Rowland et al. (2005), is utilized here as an alternate indicator of road effects on elk habitat in the East Face project area. Table 5 shows habitat effectiveness values for roads using distance banding (HE_Distance_Band). Results indicate lower HE_{road} values when using distance banding as compared to using road densities (0.39 vs. 0.51). These lower HE_{road} values equate to lower overall HEI values, which is likely a more accurate portrayal of HEI than when calculated using road densities. However, HEI still remains above Forest Plan recommended levels and action alternatives do not change HEI_{road} values.

Currently there are two areas with seasonal closure restrictions within the East Face project area; Indian Creek-Gorham Butte and Clear Creek. These areas are closed from October 26th to Nov 16th for the bull elk rifle season. This restriction was put in place over 20 years ago in response to heavy hunter traffic during the rifle season. However, over the years the heaviest use period has changed from rifle season to archery season and the travel restrictions are no longer performing their function. Alternative 5 proposes increasing the closure period to include all of the big game hunting seasons, providing disturbance relief for the elk and a better hunting experience for hunters. Alternatives 2, 3, and 4 would not provide these improvements for elk or hunters.

Cumulative Effects for Rocky Mountain Elk

Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF lands have been incorporated into the existing condition. The current condition of elk habitat is largely a function of past management activities and historic large wildfires. Historically, the area was unroaded, and forest stands were less dense and provided larger amounts of forage.

Cattle grazing will continue within the project area. The majority of range acres in the project area are grazed from June 1 – October 30. Resource partitioning between elk and cattle in northeastern Oregon was studied by Stewart et al. (2002). Elk utilized steeper slopes and higher elevations than cattle when cattle were present, possibly indicating competitive displacement of elk by cattle. Diet overlap between cattle and elk has been described, and is most prominent when forage resources are limited. However, most of the rangeland on NFS lands contained within the analysis area is in satisfactory condition.

The cooperative closure areas would seasonally offset disturbance within the project area by increasing big game security habitat and escapement during some hunting seasons under Alternatives 2-4 and increasing that period of time to all hunting seasons under Alternative 5.

Firewood cutting within this area may increase into additional areas due to the clearing and re-opening roads that have grown closed providing for increased disturbance from noise, vehicles, and people reducing security habitat during firewood season. More of this would occur under Alternatives 5 and 2 with the least number of miles re-opened under Alternatives 3 and 4.

Clearing and re-opening roads that have grown closed could also increase OHV access into the area which would also increase disturbance from noise and vehicles reducing security habitat. The Forest Travel Management Plan is expected to be in place within the foreseeable future. This plan would increase security habitat reducing levels of human intrusion by managing cross-country motor vehicle use and restricting use to designated roads, trails, and areas. This has the potential decrease disturbance and stress and increase habitat security having a positive effect on elk distribution and escapement during hunting seasons.

Conclusion

All action alternatives are consistent with LRMP standards and guidelines pertaining to elk. Treatments proposed under all action alternatives are expected to maintain or slightly improve elk habitat effectiveness, as indicated by HEI values, mostly due to an increase in forage availability. Proposed road openings and closures make small immeasurable changes to road density or HEI_{road} values. Increasing the seasonal closures on Indian Creek-Gorham Butte and Clear Creek closure areas as proposed in Alternative 5 would enhance elk security habitat during a time of increased disturbance and would have a positive effect on elk distribution and escapement. All action Alternatives would increase forage, but Alternatives 2 and 5 would have the greatest positive effect on forage availability in summer habitat.

Old Growth Habitat: American Marten, Northern Goshawk, and Pileated Woodpecker

Introduction

The American marten, northern goshawk, and pileated woodpecker are MIS of old growth habitat (U.S. Forest Service 1990). Old-growth habitat is categorized and analyzed in 2 categories according to the LRMP: 1) late old-growth structure; and 2) MA15 – Old-Growth Preservation. MA15 is a land allocation under the LRMP (U.S. Forest Service 1990) intended to provide quality habitat for wildlife species associated with old growth characteristics. Old growth is a structural classification used to implement direction in the Forest Plan Amendment #2 (Screens; U.S. Forest Service 1995) and refers to multi-strata stands with large trees (Old Forest Multi-Stratum- OFMS) and single-stratum stands with large trees (Old Forest Single Strata- OFSS). Although the two terms have different administrative implications, both are intended to provide habitat for old growth associated wildlife species.

Old growth habitat and old growth management indicator species will be discussed separately below to provide an overview of old growth habitat in general within the project area and at the landscape scale along with the effects of the East Face project on each of the species dependent on this habitat.

Correct determination of the scale of analysis is the cornerstone of habitat analysis (Morrison et al. 2006). The choice of spatial scale must be based on the species' relationship with the landscape and should consider the scale at which to apply our results for management purposes (Morrison et al., 2006). Wildlife habitat is commonly analyzed at the watershed scale because it

provides a systematic way to understand and organize ecosystem information and thus enhances the ability to estimate direct, indirect, and cumulative effects of management activities (Regional Interagency Executive Committee 1995). However, the watershed scale may be too fine to analyze viability for wide-ranging species' unless it can be placed within the broader context of how the watershed contributes to overall species viability (Regional Interagency Executive Committee 1995).

Impacts to old growth and old growth dependent MIS species within the East Face project area were determined by analyzing effects to their habitat at several spatial scales starting with the watershed then framing that within the context of the Wallowa-Whitman National Forest and the Blue Mountains Ecological Province. These scales take into account the species' relationship with the landscape as well as being practical for management purposes. MIS population viability assessments have been conducted for American marten, pileated woodpecker, and northern goshawk at the Blue Mountains and WWNF. These assessments are incorporated by reference within the existing condition and effects analysis for each species. For more in-depth information on the methodology behind these assessments, please refer to the full-length assessments in the project record and the associated peer-reviewed literature scales (Penninger and Keown 2011a, Penninger and Keown 2011b, Penninger and Keown 2011c).

A. Old Growth Habitat

Background information

Declines in single stratum large trees structure (late-seral ponderosa pine) has been well documented (Wisdom et al. 2000, Squires et al. 2006), while mid-seral shade-tolerant forests seem to be at nearly twice their historical levels. These changes benefit some species but negatively affect others. The winter wren, Swainson's thrushes, pileated woodpeckers and American marten favor dense, multi-storied forests. These species are rarely associated with open ponderosa pine and open mixed-conifer types, which historically were widespread in many dry landscapes. Other wildlife species, however, such as the white-headed woodpecker and flammulated owl are associated with open, old-growth ponderosa pine (Sallabanks et al. 2001) and their populations have possibly declined as result of the loss of this forest type (Csuti et al. 1997, Wisdom et al. 2000).

Thinning reduces competition-induced- mortality in a stand, and can likely enhance habitat for species associated with late seral conditions, particularly if critical structural components, such as dead wood, are provided and if stands are managed to provide vertical and horizontal heterogeneity. Effects of thinning on a given species of wildlife may vary across a range of temporal and spatial scales. For example, large tree crowns may ultimately improve habitat for some small mammals and some species of birds to nest and forage, but increased spacing between crowns may temporarily decrease habitat suitability and inhibit dispersal. Hayes et al. (1997) states that knowledge of many species is inadequate to predict responses at multiple time frames, but it is important to consider short- and long-term as well as stand- and landscape-level perspectives when evaluating the implications of thinning.

Regional Forester Amendment #2 of June 12, 1995 established interim riparian, ecosystem, and wildlife standards for timber sales (these standards are referred to as the “Eastside Screens”). The Eastside Screens require that a range of variation approach be used when comparing historical reference and current conditions, incorporating the best available science. The range of variation approach assumes that native species have evolved with the historical disturbance regimes of an area and so a forest will continue to sustain populations of those species if current conditions fall within the historic range of variation (Powell 2010). The following range of variation analysis uses methods described in Range of Variation Recommendations for Dry, Moist and Cold Forests (Powell 2010), which is now considered the best available science. Five forest structural stages are identified within these three potential vegetation groups; Stand Initiation (SI), Stem Exclusion (SE), Understory Retention (UR) and Old Forest Single Stratum (OFSS) and Old Forest Multi Strata (OFMS).

LRMP standards and guidelines

The Regional Forester’s Eastside Forest Plan Amendment #2 (SCREENS) contains standards and guidelines for old growth (U.S. Forest Service 1995). Standards and guidelines include maintaining all existing remnant late and old seral and/or structural live trees >21” dbh. According to the LRMP, areas allocated to MA15 have no scheduled timber harvest although salvage may occur following catastrophic destruction if more suitable replacement stands exist.

The SCREENS also provides direction for connectivity. Old growth stands are directed to be connected in a least two different directions by the shortest length, minimum 400 ft. wide corridor which maintains canopy cover in the upper one-third of the site potential. If this standard cannot be met, proposed treatments are dropped.

Existing Conditions

MA-15 Old Growth Preservation-

There are 2,906 acres of MA15 allocated land in the analysis area. Suitable old growth habitat generally contains large diameter live trees, large snags and down wood; old forest multi story (OFMS) provides old growth habitat along with understory re-initiation (UR), though UR typically lacks the density of large structure.

Late Old-Growth Structure

Analysis was conducted at the project level totaling 47,636 acres. Moist old forest multi-story (OFMS) is below HRV and all potential vegetation groups (PVG) are below the historic range of variability (HRV) and deficient in old forest single-story (OFSS) (Table 7).

Table 7 - Comparison of HRV to existing by potential vegetation group (PVG) in the East Face project area

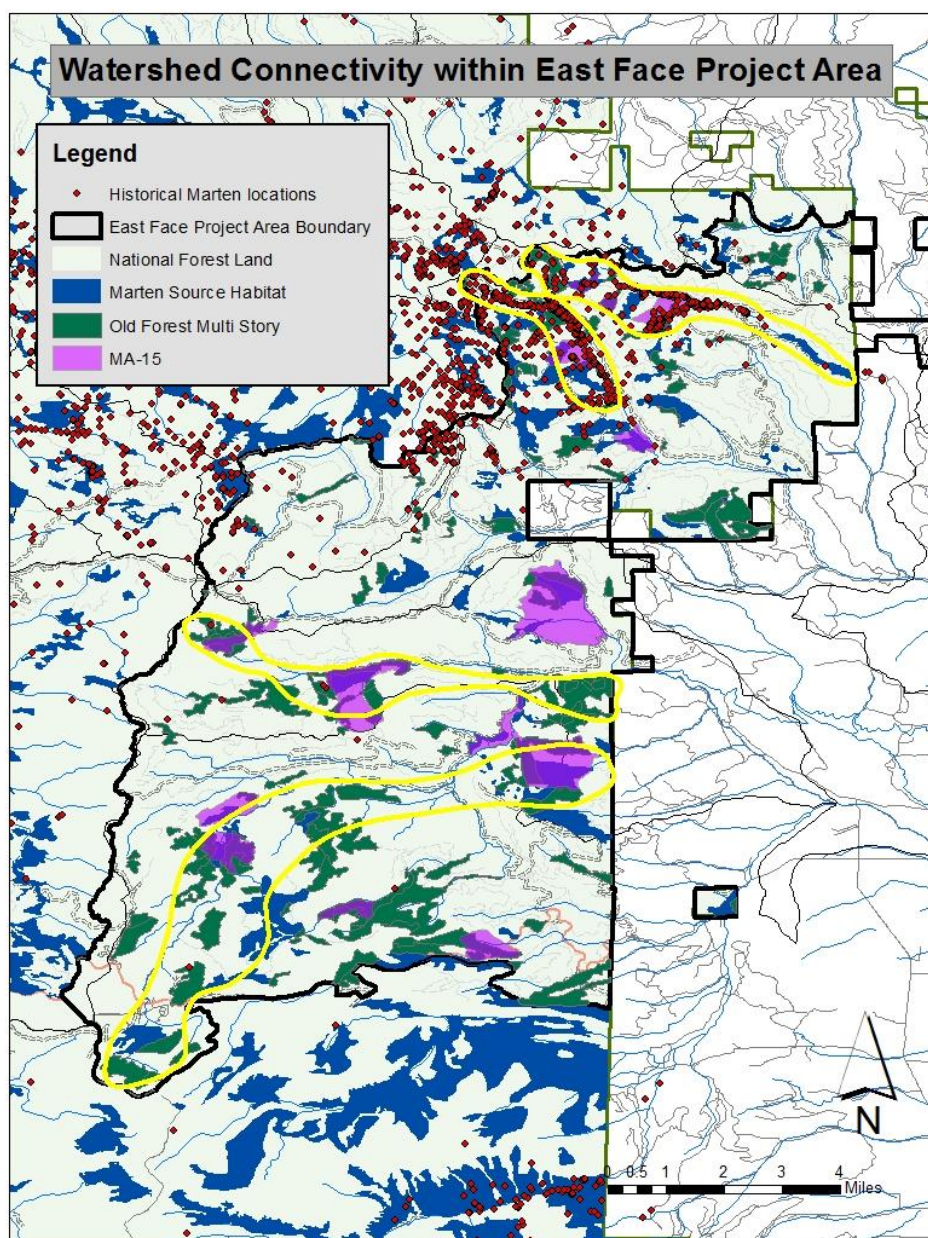
PVG	Existing Acres	% of PVG	Historical Range %
Old Forest Multi Stratum (OFMS)			
moist upland	2,277	12%	15-20%
dry upland	929	10%	5-15%

PVG	Existing Acres	% of PVG	Historical Range %
cold upland	2,574	16%	10-25%
Old Forest Single Stratum (OFSS)			
moist upland	27	0%	10-20%
dry upland	257	3%	40-60%
cold upland	392	2%	5-20%

Connectivity

According to the SCREENS Forest Plan Amendment (U.S. Forest Service 1995), connectivity corridors do not necessarily meet the same description of “suitable” habitat for breeding for old growth species, but allows free movement between suitable breeding habitats. Identifying these connective corridors ensures that blocks of habitat maintain a high degree of connectivity between them, and do not become fragmented in the short-term. Connective corridors between patches of old growth structures have been identified on a map that is on file at La Grande Ranger District. These connective corridors are small blocks of land that attempt to provide connectivity between old-growth stands at a small scale.

Figure 1 - Watershed Connectivity (identified in yellow lines) within the East Face Project Area



Distribution of OFMS stands and MA15 areas, marten source habitat (due to its identified high canopy cover) slope aspect and marten location information for verification, was used to identify watershed level landscape scale corridors and permeability (different from the fine-scale connective corridors between old-growth stands and identified by the yellow blocks on Figure 1). These corridors span the East Face project area in multiple spots and connect to the adjacent watersheds, most notably to the Grande Ronde River- Beaver Creek watershed which was the location of the majority of marten research on the Wallowa-Whitman and has been identified as an important area for marten. These corridors contain the majority of the old growth and MA15 found within the East Face project area and occur on north and north-east facing slopes with the assumption that these areas have the greatest potential for productivity and will contain the highest levels of canopy cover and multi-level complexity. These areas were built into the project design and none of the proposed treatments fragment these identified corridors. The majority of proposed fuels treatments occurs alongside these identified corridors, and by reducing the risk of wildfire, adds protection to these more complex areas that would be removed from the landscape if a wildfire entered them (Figure 1).

Effects

Assumptions

The direct and indirect effects analysis area for old growth is the 5th HUC watersheds containing the East Face project area (Wolf Creek/Powder River, North Powder River and the Grande Ronde Beaver Creek watersheds). The cumulative effects boundary for old growth habitat is the 2.4 million acre Wallowa-Whitman National Forest boundary.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on Old Growth resources.

- Roadside hazard tree removal
- Closed roads reopened for administrative access
- Road decommissioning
- Temporary road construction & Road reconstruction
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement
- Mechanical Control Lines for Burning

These activities and their effects will not be discussed further in the effects to Old Growth section.

Direct/Indirect Effects on Old Growth

ALTERNATIVE 1

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Existing MA15 and old growth would be at risk if uncharacteristic wildfire and/or disease and insect outbreaks occurred. Old forest single story structure would continue to be deficient across all potential vegetation groups.

Connective Corridors

Alternative 1 would have no direct effect on connectivity between old growth patches. The current level of connectedness would persist, and would improve in quality in the absence of large scale disturbances. In the absence of treatments that would reduce stocking, the connective corridors will continue to increase in canopy closure and structural complexity. This condition in cold and moist upland forests would enhance connectivity for species like American marten. Although connectivity would be enhanced over time, risks from insects, diseases, and wild fire would increase. Conversely, dry upland forests are inherently less structurally complex than cold and moist upland forests. In the absence of silvicultural treatments to reduce stocking, the stands would continue to allow establishment of shade tolerant grand fir, increased canopy closure, and increased stress to competition for resources. In the long-term these drier stands would be subjected to increased risks from wildfire, insects and diseases that will kill trees in numbers and distribution that could negatively affect connectivity between patches of old forest single story.

ALTERNATIVES 2 and 5

Commercial

Alternatives 2 and 5 would have the same effects to old growth and will be analyzed together. Proposed commercial treatments would occur within dry, moist and cold forest types on south facing slopes. Treatments would be applied with the intent to move the stands from an OFMS stand structure to an OFSS stand structure which is deficient in all forest types. No trees over 21 inches dbh would be removed. Commercial treatments applied within old growth for Alternatives 2 and 5 include thinning treatments, improvement treatments, sanitation treatments and harvest fuels treatments.

Thinning treatments are designed to increase the growth of residual trees. Improvement treatments thin and remove undesirable trees (poor form, damaged condition, ecologically inappropriate species etc.) within a stand for the purpose of improving the growth, composition and quality of the remaining stand. Sanitation treatments prescription is designed to remove diseased and insect damaged trees and associated trees with a high potential to become infected. The trees to be removed with this prescription in East Face are a mix of Douglas-fir and western larch with mistletoe. The treatment will remove those trees with multiple mistletoe brooms and reduce the incidence of future mistletoe. The objective in these stands will be to promote non-susceptible species in the understory. For example, in stands with Douglas-fir mistletoe

treatments will promote ponderosa pine and western larch. Harvest fuels treatments will remove trees creating ladder fuels and excess down dead woody material with the use commercial harvest methods. 269 acres of thinning treatments, 440 acres of improvement treatment, 41 acres of sanitation treatment, and 20 acres of harvest fuels treatments are proposed for both Alternative 2 and Alternative 5. These treatments would remove approximately 15-20% of the canopy cover but would not remove the stand from an old growth structure, instead promoting OFSS structure, a severely limited habitat in the East Face project area (Table 8). 38% of currently dry OFMS would be moved to OFSS, 5% of moist OFMS would be moved to OFSS and no commercial treatment within OFSS is proposed.

Non-commercial

1,656 acres of non-commercial treatments are proposed within OFMS and OFSS in both Alternatives 2 and 5. These treatments (hand, mechanical and pre-commercial thinning) are designed to remove ladder fuels and manage understory tree density at appropriate levels using manual methods. Ladder fuels are defined as trees (less than 9" DBH). These treatments will promote optimal conditions for prescribed fire and adds protection to the stands from the risk of severe wildfire. Canopy cover will not be affected during these treatments and the treatments would not move the stands from their current structure, but down wood would be reduced, minimizing available habitat for small mammals and hiding cover for young ungulates and mustelids. Down wood would still be maintained at Forest Plan levels (see Snag and Log Habitat section).

ALTERNATIVES 3 and 4

Commercial

Alternatives 3 and 4 would have similar effects to old growth stands (48 acre difference) and will be analyzed together. Proposed commercial treatments would occur within dry forest types and moist forest types on south facing slopes. Treatments would be applied with the intent to move the stands from an OFMS stand structure to an OFSS stand structure which is deficient in all forest types. No trees over 21 inches dbh would be removed. Commercial treatments applied within old growth for Alternatives 3 and 4 include thinning treatments, improvement treatments, sanitation treatments and harvest fuels treatments. Alternative 3 proposes 172 acres of thinning treatment and 257 acres of improvement treatments. Alternative 4 proposes 91 acres of thinning treatment, 15 acres of sanitation treatment, 351 acres of improvement treatment, and 20 acres of harvest fuels treatments. These treatments would remove approximately 15-20% of the canopy cover but would not remove the stand from an old growth structure, instead promoting OFSS structure, a severely limited habitat in the East Face project area. No commercial treatment within OFSS is proposed.

The majority of proposed treatments would take place within stands in the UR structure of all PVG types. Stand growth models indicate that managed UR stands would begin moving into old forest structure in approximately 30-50 years and so most treatments, with the exception of shelterwoods are expected to move UR stands to an old growth structure in the medium term. Alternative 4 is expected to accelerate 6,860 acres of UR to an old growth condition and Alternative 3 will accelerate 5,464 acres.

Non-commercial

918 acres of non-commercial treatments within OFMS and OFSS are proposed for Alternative 3 and 1,656 acres are proposed for Alternative 4. These treatments would promote optimal conditions for prescribed fire and add protection to the stands from the risk of severe wildfire. Canopy cover will not be affected during these treatments and the treatments would not move the stands from their current structure, but down wood would be reduced, minimizing available habitat for small mammals and hiding cover for young ungulates and mustelids. Down wood would still be maintained at Forest Plan levels (see Dead and Decayed Wood section).

Connective Corridors

Connectivity in the East Face area has been considered at two levels: a) connectivity at the landscape level and b) connectivity between stands of LOS/old growth. In general, all of action alternatives were designed to retain landscape level connective corridors (see Figure 1) which provide travel corridors through the project area from the valley to habitat in the wilderness and roadless areas surrounding the East Face project area.

Alternatives 2, 4, and 5 would slightly reduce the quality of connectivity corridors between stands of LOS in 17 units (12 commercial units, 5 fuel reduction treatment units). Treatment prescriptions in any units within LOS connective corridors would retain snags, large down wood, and multiple canopy layers (if appropriate for the site). Basal area would also be maintained within the upper half of the management zone, which would approximate canopy closures in the upper 1/3 site potential. Stocking levels would be managed at the upper management zone for basal area except where tree quality and crown conditions are such that this level of stocking is unattainable, in these areas, 20% of the stand would be retained in untreated clumps. Trees with as little as 20% live crown would be retained if needed to maintain basal area levels. All snags greater than or equal to 12 inches dbh would be retained. Down logs would be retained at 200 lineal feet per acre, minimum lengths of logs 20 feet or largest available and minimum of 12 inch small end diameter logs or largest available. Silvicultural prescriptions in connective corridor units would reduce competition between residual trees, increase tree growth rates, and increase trees' ability to defend against insects and diseases, while retaining levels of canopy closure and structural complexity to facilitate movement of wildlife between old-growth habitat patches.

Alternative 3 would impact the quality of connectivity corridors in 7 units (2 commercial units, 5 fuel reduction units). Mitigation of these units would be the same as described above. This alternative would have the least impact on LOS connectivity corridors.

Summary

Table 8 - Comparison of Old Growth Stand Structure to HRV after Proposed Treatments

Structure/PVG	HRV	Alternatives				
		1	2	3	4	5
OFMS- Moist	15-20%	12%	11%	12%	12%	11%
OFMS- Dry	5-15%	10%	5%	5%	6%	5%
OFMS- Cold	10-25%	16%	16%	16%	16%	16%

Structure/PVG	HRV	Alternatives				
		1	2	3	4	5
OFSS- Moist	10-20%	0.14%	0.7%	0.14%	0.4%	0.7%
OFSS- Dry	40-60%	3%	10%	9%	7%	10%
OFSS- Cold	5-20%	2%	3%	2%	3%	3%

There is no net loss of late old structure (LOS) from any of the action alternatives within the project area. All action alternatives maintain OFMS stand structure within the HRV for each PVG. While OFSS structure would remain severely below HRV in all PVGs, each of the action alternatives would move each of the PVGs toward HRV with the most acres are restored in the dry forest habitat increasing them 4-7%. The largest increase in dry PVGs is in Alternatives 2 and 5 followed by Alternatives 3 and 4 (Table 8).

Cumulative Effects on Old Growth

The existing condition of the East Face project area is a reflection of past management activities which will be taken into consideration along with the present and reasonably foreseeable future activities in the assessment of cumulative effects. Refer to Appendix D for a complete listing of present and reasonably foreseeable future projects and a compilation of the old forest acres treated in Forest Plan amendments on the Wallowa-Whitman National Forest.

ALTERNATIVE 1

There would be no cumulative effects from selecting this alternative. Any changes that would occur over time as a result of selecting this alternative would simply reflect the evolving baseline conditions for the area. Under this alternative, the project area would continue to be deficient in LOS. Past logging (selective harvest) and uncharacteristic wildfires have led to the current lack of old, big trees in the area and this alternative would perpetuate the presence of shade tolerant tree species in areas where they cannot be sustained without creating wildfire risk.

ALTERNATIVES 2, 3, 4 and 5

Of the approximately 311,730 acres of old forest (OFMS and OFSS) located on the WWNF, approximately 10,940 acres are single stratum (OFSS) and 300,790 acres are multi-stratum (OFMS). As can be seen in table X, OFMS is within the historic range of variation across all vegetation groups; however, OFSS is well below HRV in all vegetation groups.

Table 9 – Existing WWNF OFMS and OFSS acres by PVG.

PVG	Existing Structure		% of PVG		HRV	
	OFMS	OFSS	OFMS	OFSS	OFMS	OFSS
Cold Upland Forest	120,715	4,690	22%	1%	10-25%	5-20%
Dry Upland Forest	81,565	4,685	7%	<1%	5-15%	40-60%
Moist Upland Forest	98,510	1,565	19%	<1%	15-20%	10-20%

Approximately 2,682 acres (<1% of all old forest and approximately 1% of all OFMS structure) has been treated to date under previous project-specific plan amendments (Appendix D). Approximately 157 acres of OFMS in the Cove II WUI project were treated to reduce understory fuel loadings; however, prescriptions were modified to maintain the OFMS stand structure. The goal of the remaining 2,682 acres of past treatments were to restore stands to their historic structure, enhance the health of the stands, and provide for the habitat needs of old-growth associated wildlife species, in particular those species that rely on OFSS stand structural components. Old forest single story structure is well below the 5 – 65% historic range of variation for all vegetation groups forest-wide (Table 9). These treatments have and will maintain old growth habitat, as defined by Forest Standards, while maintaining adequate levels of down logs and snags.

Alternatives 2, 4, and 5 propose to treat approximately 62-97 acres of OFMS in dry and moist vegetation groups to reduce fuel loadings and restore it to OFSS structure, which is currently less than 1% of the forested landscape, and substantially below HRV (Table 9). The cumulative effects of implementing the plan amendment under Alternatives 2, 4, and 5 to treat OFMS stands to restore single stratum structure and composition, and maintain old forest habitat, in combination with similar past amendments on the WWNF are minor (1% of all OFMS structure), but positive relative to the extent of the restoration need Forest-wide. OFMS structure across the WWNF would remain within the historic range of variability in all vegetation groups.

Proposed commercial treatments within OFMS within the adjacent Elkhorn Wildlife Area (EWA) on State owned lands would reduce the complexity of the stand in the short term and potentially move the multi-story to a single story condition. However, there is very little OFMS structure within the EWA.

Precommercial thinning treatments on adjacent private lands simplify understory condition and long term contributes to larger average diameter; therefore, in combination with the action alternatives in the East Face project area, more acres would experience accelerated tree growth. Precommercial treatments do not remove stands from current structural stage and are not proposed within old growth on private lands. Private land commercial harvest activities are expected to continue to maximize commercial output and mitigate wildfire danger. These treatments are not expected to maintain old growth conditions and old growth habitat is expected to decrease on private land.

The effects of not treating in the stands proposed for a forest plan amendment are described under the effects discussions for Alternative 1 generally placing the area and resources at risk to loss from insects, disease, and large wildfires.

B. Old Growth Management Indicator Species

The following describes the existing conditions and effects of the East Face project on three old growth management indicator species:

Section I – American Marten
Section II – Northern Goshawk
Section III – Pileated Woodpecker

Assumptions

The direct, indirect, and cumulative effects analysis area for these old growth management indicator species is the North Powder River, Powder River-Wolf Creek and Grande Ronde River-Beaver Creek watersheds. This area is over XXX,XXX acres.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on old growth management indicator species.

- Roadside hazard tree removal
- Hand treatments within RHCAs
- Closed roads reopened for administrative access
- Road decommissioning
- Temporary road construction & Road reconstruction
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement
- Mechanical Control Lines for Burning

These activities and their effects will not be discussed further in the effects to old growth management indicator species sections below.

I. American Marten (*Martes americana*)

Background information

The American marten (*Martes americana*, - hereafter marten) is associated with mature, mesic coniferous forests and is one of the most habitat-specialized mammals in North America (Bull and Heater 2001). Martens require complex physical structure in the forest understory created by lower branches of trees, shrubs and coarse woody debris (Buskirk and Ruggiero 1994, Witmer et al. 1998, Bull and Heater 2000). Marten in northeastern Oregon have been documented using large-diameter hollow trees and logs, accumulations of coarse woody debris, and trees with brooms for denning and resting sites (Bull and Heater 2000). 70% of martens in eastside mixed conifer forests used snags > 23.9 in dbh for denning and resting and downed wood > 20.7 in dbh for denning, resting and foraging (Mellen-McClean et al. 2009).

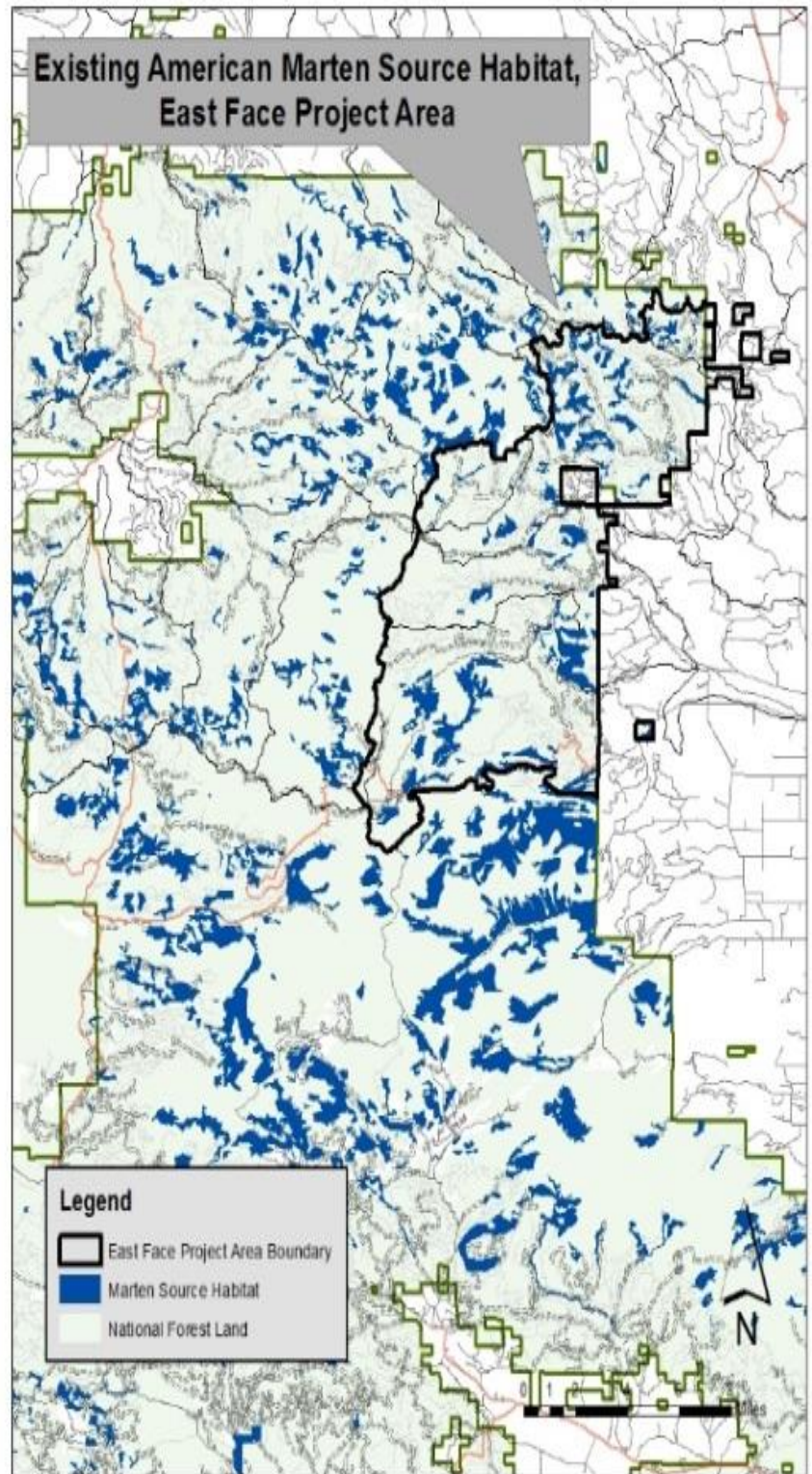
Viability Determination

Wisdom et al. (2000) assessed broad-scale trends of 91 species in the interior Columbia Basin, including the marten. The historical estimate of source habitat for marten in the Blue Mountains was 8.83%, which increased to 23.5% by the 1990s. By managing habitat similar to historical conditions, it is assumed that remaining habitat will be adequate to ensure population viability

because species survived those levels of habitat in the past to be present today (Landres et al. 1999).

Source habitat for marten was evaluated on the Wallowa-Whitman National Forest (Penninger and Keown 2011a) and represents the highest quality habitat which contributes to species viability. Source habitat for American marten is considered to be cold-moist and cold-dry forests with multi-stories, large tree structure and closed canopies. The threshold of $\geq 40\%$ of the historical amount of source habitat in a watershed was used to identify watersheds with a relatively high amount of source habitat. Watersheds that contain $\geq 40\%$ of the estimated historical median amount of source habitat are believed to provide for habitat distribution and connectivity, and better contribute to species viability across the forest. Not all watersheds on the Wallowa-Whitman NF have the potential to provide source habitat for marten; historically 76% of the watersheds provided source habitat and currently 68% of the watersheds provide source habitat. Although the viability outcomes for the current condition are lower than the historical, habitat is estimated to currently exist in the quality, quantity, and distribution capable of supporting a viable marten population at the Wallowa-Whitman National Forest scale.

Figure 2 - Existing marten source habitat, East Face Project Area



Existing Conditions

Wolf Creek- Powder River Watershed

The northern portion of the East Face planning area lies within the Upper Wolf Creek subwatershed of the Wolf Creek-Powder River watershed (5th HUC). This watershed contains 396 existing acres of marten source habitat (habitat that can support a stable or increasing population of marten) out of 9,335 (4%) potential acres of marten habitat. The current watershed index is 0.63 with the historic watershed index at 2.85, indicating a high historic level of habitat quality and a current low level of habitat quality and quantity. This watershed currently does not provide $\geq 40\%$ of the median amount of source habitat that occurred historically, and is not above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). This does not preclude marten from using the area as secondary habitat (hunting and traveling) but indicates that the majority of the habitat is not suitable for denning.

Grande Ronde River- Beaver Creek

A small portion of the northwest corner of the East Face project area lies within the Grande Ronde River- Beaver Creek watershed. This watershed contains 2,399 existing acres of marten source habitat (habitat that can support a stable or increasing population of marten) out of 33,101 (7%) potential acres of marten habitat. The current watershed index is 0.63 with the historic watershed index at 2.64, indicating a high historic level of habitat quality and a current lower level of habitat quality and quantity. This watershed currently does not provide $\geq 40\%$ of the median amount of source habitat that occurred historically, and is not above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). This does not preclude marten from using the area as secondary habitat (hunting and traveling) but indicates that the majority of the habitat is not suitable for denning. Research conducted by the Pacific Northwest Research Station during the mid-1900's on marten show high levels of activity within the watershed and between adjacent watersheds including the Wolf-Creek Powder River watershed. This indicates habitat quality within the Grande Ronde River-Beaver Creek watershed is higher than predicted by the model.

North Powder River Watershed

The rest of the East Face planning area lies within the Anthony Creek and portions of the Antone Creek drainages in the North Powder River Watershed. This watershed contains 4,876 existing acres of marten source habitat out of 36,557 (13%) potential acres of marten habitat. The current watershed index is 2.49 with the historic watershed index at 2.82, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed provides $\geq 40\%$ of the median amount of source habitat that occurred historically, and is above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). This area likely is used for hunting, traveling, and denning.

East Face Project Area

Primary source habitat for marten is defined as habitat within moist and cold upland forests in the LOS stage with $\geq 60\%$ canopy closure and ≥ 20 inch dbh as the tree size. According to a GIS

query, the East Face project area contains 3,907 acres of primary habitat, 8% of the project area (Figure 2). Marten research conducted by the Pacific Northwest Research Station performed during the mid-1990's in the adjacent Grande Ronde River-Beaver creek watershed gives a picture of marten activity within parts of the East Face project area. Tagged marten were shown moving between watersheds, primarily using habitat in the upper west corner of the project area and moving down the north facing drainages of Clark creek and Wolf creek. These drainages contain the majority of the moist OFMS found within the upper north portion of the project area. Remote sensing cameras were utilized in the summer of 2014 in areas identified as marten habitat. Marten were detected on the upper western boundary of the project, in the same area the 1990's research found marten. This verification gives weight to the assumption that marten are moving and using their habitat in a similar manner as during the time of the research study. Marten have also been picked up on remote cameras at the southern edge of the project area in the vicinity of the Anthony Lakes Ski Area.

Effects

Direct/ Indirect Effects for American Marten

ALTERNATIVE 1

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Assuming no uncharacteristic wildfires or disease/insect outbreaks, marten and their prey would likely continue to benefit from dense stands.

Existing marten habitat may be at risk if the project area is left untreated because existing OFMS stands and MA15 stands may be lost to uncharacteristic wildfire and/or disease and insect outbreaks. If these occurred, the condition of habitat for the marten and its prey would likely decline due to a loss of canopy cover and structural diversity, and then slowly improve over the long-term. The loss of over story cover would represent a long term reduction. Existing levels of snags and down wood would be at risk from uncharacteristic wildfire. The impact to marten habitat would depend on the size and severity of the disturbance.

ACTION ALTERNATIVES

Commercial treatments

Alternatives 2, 3, 4, and 5 are similar in their potential impact to marten habitat and will be analyzed together (Table 10). Of the four alternatives, a maximum of 3% of the available marten habitat within the East Face analysis area is proposed for commercial treatments. Alternatives 2, 3, 4, and 5 propose commercial treatments within 3%, 3%, 1% and 2%, respectively, of marten source habitat within the East Face analysis area. Proposed commercial treatments include sanitation treatments, improvement treatments and harvest fuels treatments. Stands that will be affected by commercial treatments are in Old Forest Multi Story (OFMS) and Understory Reinitiation (UR) structure stages.

Commercial treatments within OFMS are focused on moist forest types on south facing hillsides that historically would have been in the Old Forest Single Story (OFSS) structure stages. The treatments would reduce the canopy and simplify the structure, moving it toward OFSS. This would reduce the potential for the stand to function as source habitat for marten. Since this structure stage is considered to be ecologically appropriate in these areas, future management activities would attempt to preserve the OFSS and this would be a permanent move away from marten source habitat. Commercial treatments within UR stands would also reduce canopy cover and reduce the complexity of the stand; however, treatments within UR are designed to create healthier stands and accelerate their structure toward old growth conditions. Sanitation treatments would remove a portion of the population of mistletoe within stands targeted for this treatment, which would reduce resting and denning sites for marten (Bull & Heater 2000). The reduction in marten source habitat within these stands would be in the medium term (30-50 years). In Alternatives 2 and 4, 16 acres of improvement treatment is proposed within a connective corridor. This treatment would maintain both canopy cover and down wood at the upper management level and still provide for movement between patches of source habitat. No patch openings, which are considered barriers to marten movement, are proposed within marten habitat.

Non-commercial treatments

The greatest difference between alternatives is Alternative 3 which has a 10% reduction in non-commercial fuels treatments compared to Alternatives 2, 4 and 5 which propose treatment in ~28% of identified marten habitat (Table 10). Fuels reduction treatments include hand treatments, mechanical treatments and pre-commercial thinning. Fuel treatments do not remove canopy cover but do remove ladder fuels-small diameter trees, understory vegetation, and branches near the ground with the result of simplifying stand structure and reducing security for marten. Katie Moriarty (2014) compared marten movement within open, simple stands treated with fuels treatments and untreated complex stands. She found that martens selected home ranges with a disproportionate amount of complex stands and avoided openings. This implies that on a landscape level, only the percentage of openings affected the placement of marten home ranges; however, simple stands were marginally avoided compared to complex stands. Marten movement within simple stands vs. complex stands suggests that marten use simple stands for travel and for intermittent foraging but not for denning.

Table 10 - Comparison of affected marten habitat by Alternative (acres). Percentages within table indicate affected percentage of identified marten source habitat

Treatment Type	Acres/ Percent Habitat	Alternatives				
		1	2	3	4	5
Commercial treatments	Acres	0	102	102	40	82
	Percent Habitat		3%	3%	1%	2%
Non-commercial treatments	Acres	0	1,072	616	1,056	1,148
	Percent Habitat		27%	16%	27%	29%
Total affected acres	Acres	0	1,174	718	1,096	1,230
	Percent Habitat		30%	19%	28%	31%

Landscape permeability

Identified marten source habitat, distribution of OFMS stands and MA15 areas, marten location data and slope aspect was used to identify landscape scale corridors and permeability (different

from the fine-scale connective corridors between old-growth stands). These corridors span the East Face project area in multiple spots and connect to the adjacent watersheds, most notably to the Grande Ronde River- Beaver Creek watershed which was the location of the majority of marten research on the Wallowa-Whitman and has been identified as an important area for marten. These corridors contain the majority of the old growth and MA15 found within the East Face project area and occur on north and north-east facing slopes with the assumption that these areas have the greatest potential for productivity and either currently contain the necessary complexity for marten movement and denning, or have the ability to achieve that complexity in the short term. None of the proposed treatments fragment these identified corridors. The majority of proposed fuels treatments occurs alongside these identified corridors, and by reducing the risk of wildfire, adds protection to these more complex areas that would be removed as marten habitat if a wildfire entered them (Figure 2).

Cumulative Effects for American Marten

Past, present and reasonably foreseeable future actions were analyzed for cumulative impacts to the species. Effects of past activities including road construction, fire suppression, prescribed fire, woodcutting and timber management on WWNF lands have been incorporated into the existing conditions for amounts and locations of marten habitat in the analysis area.

ALTERNATIVE 1

There are no cumulative effects to marten from this alternative.

ACTION ALTERNATIVES

Precommercial thinning work is proposed within the Wolf Creek Powder River watershed during 2015-2016 and is expected to have no impact on marten because the area proposed for treatment contains no suitable marten habitat. Commercial treatment and fuel reduction treatments within the Elkhorn Wildlife Area (EWA) may have an impact on marten habitat as canopy cover will be reduced and stand structure will be simplified. However, very little marten habitat occurs within the EWA. Timber harvest on private inholdings is expected to continue at some level, with anticipated reduction of trees larger than 10" dbh, but generally marten habitat does not occur on private inholdings in the East Face project area.

Conclusion

Alternatives 2, 4, and 5 propose treatments that would simplify 30% of potential marten source habitat within the East Face analysis area. The majority of these treatments would provide wildfire protection to identified landscape corridors of existing productive and complex stands for old growth dependent species. Alternative 3 proposes less fuels treatments which would simplify 10% less potential marten habitat (Table 10). This Alternative would have the least negative impact on marten source habitat, but would also marginally increase the risk of wildfire that could remove marten habitat from the landscape in the long term.

Existing marten source habitat on the WWNF as modeled by Wales (2011) totals 129,943 acres. As a result of proposed activities under the East Face project, source habitats would decline by less than 0.1% under all action alternatives. Cluster analysis used to describe existing distribution

of source habitats across the WWNF indicates that these habitats are well distributed across the forest (Penninger and Keown 2011a). Post treatment availability of source habitat would continue to exceed the threshold of 40% of the historical amount in the North Powder River watershed and will continue to contribute to habitat distribution and species viability on the WWNF. Because this project impacts less than 0.1% of suitable habitat across the Forest, the overall direct, indirect and cumulative effects will result in a very small negative effect to marten habitat. The decrease in habitat quality will be insignificant at the scale of the WWNF. The East Face project will not reduce habitat permeability for marten and fuel reduction treatments will help protect important key areas of landscape connectivity.

II. Northern Goshawk

Background information

The Northern goshawk (*Accipiter gentilis*, hereafter goshawk) was chosen as a supporting indicator of abundance and distribution of mature and old-growth forests (LRMP 1990). The goshawk is associated with dense canopied mixed conifer, white fir, and lodgepole pine associations (Wisdom et al. 2000). Important habitat attributes of goshawk prey species include snags, down logs, woody debris, large trees, openings, herbaceous and shrubby understories, and an intermixture of various forest structural stages (Wisdom et al. 2000). Goshawks are prey generalists and use open understories below the forest canopy and along small forest opening to forage for mammals and small birds (Bull and Hohman 1994, Marshall 1992, Squires 2000).

Goshawks use broad landscapes that incorporate multiple spatial scales to meet their life requisites (Squires and Kennedy 2006). At least three levels of habitat scale are recognized during the breeding season: (1) a nest area, composed of one or more forest stands or alternate nests; (2) a post fledging area (PFA), which is an area around the nest used by adults and young from the time of fledging, when the young are still dependent on the adults for food, to independence; (3) a foraging area that comprises the breeding pairs entire home range (Reynolds et al. 1992, Reynolds 1983).

The nest area, or nest site, is the area immediately surrounding the nest tree, including the forest stand containing the nest tree. In general, goshawk nest areas are unique in structure, with large trees, dense and multiple canopies, and high canopy closure (>50%) primarily within mature and older forests with high amounts of down wood and snags (Finn 1994, McGrath et al. 2003).

The post fledging area (PFA) surrounds the nest area and is defined as the area used by the family group from the time the young fledge until they are no longer dependent on the adults for food (up to two months) (Reynolds et al. 1992, Kennedy et al. 1994). PFAs generally have patches of dense trees, developed herbaceous and/or shrubby understories and habitat attributes (snags, down logs, small openings) that are critical for goshawk prey (Reynolds et al. 1992). The PFA is potentially important to the persistence of goshawk populations, as it may correspond to the area defended by the breeding pair and provides fledgling hiding cover and foraging opportunities as fledglings learn to hunt.

Viability Determination

Throughout the Interior Columbia Basin, the amount of source habitat (i.e., habitat requirements to provide long term population persistence) available to the goshawk has declined from historical conditions. The greatest declines have occurred in the interior ponderosa pine and western larch forest types. It is estimated that there has been a 96% decline in old forest single-story ponderosa pine (Wisdom et al. 2000). However the interior Douglas-fir, grand fir, white fir, lodgepole pine, and juniper sagebrush have all increased in abundance from historical conditions. The overall decline in source habitat and strong decline in the ponderosa pine cover type is offset somewhat by increases in these other cover types and structural stages that provide source habitat.

Additional source habitat analysis was conducted at a finer scale on National Forest lands as part of a species viability assessment conducted in support of the Blue Mountains Forest Plan revision (Penninger and Keown 2011b). The threshold of $\geq 40\%$ of the historical amount of source habitat in a watershed was used to identify watersheds with a relatively high amount of source habitat. Watersheds that contain $\geq 40\%$ of the estimated historical median amount of source habitat are believed to provide for habitat distribution and connectivity, and better contribute to species viability across the forest. Thirty-two of the thirty-five watersheds on the Wallowa-Whitman National Forest (WWNF) which historically provided source habitat are above the historical median of source habitat providing 440,696 acres (94% of historical condition) of goshawk habitat. While the presence of roads and trails has decreased the habitat effectiveness of source habitat in most watersheds (67% in the low habitat effectiveness class) the majority of watersheds (86%) on the WWNF have high watershed index scores. High watershed index scores indicate good habitat abundance with low departure from historical conditions, and high habitat quality, with greater 50% of the source habitat being late-successional habitat.

The current viability outcome index for the WWNF show that current source habitat for the goshawk is slightly lower than for the entire Blue Mountains but is very near historical conditions, indicating that suitable habitats are broadly distributed and of high abundance, and the goshawk is likely well-distributed throughout the WWNF (Penninger and Keown 2011b).

LRMP Standards and guidelines- The Regional Forester's Eastside Forest Plan Amendment #2 (SCREENS) requires that all known and historically used goshawk nest-sites be protected from disturbance. An active nest is defined as a nest that has been used by goshawks within the past five years. SCREENS requires that a 30-acre buffer of the most suitable nesting habitat be established around every known active and historical nest tree(s), that it be deferred from harvest, and that a 400-acre post fledging area be established around every known active nest site. While harvest activities can occur within the PFA, up to 60% of the area should be retained in LOS conditions and harvest is to promote the development of LOS. Management of the PFA is intended to provide a diversity of forest conditions. Thinning from below with irregular spacing of leave trees would maintain the appropriate stand composition and structure. A seasonal restriction on logging in the PFA would be implemented during the nesting season from March 1 – September 30.

Existing Conditions

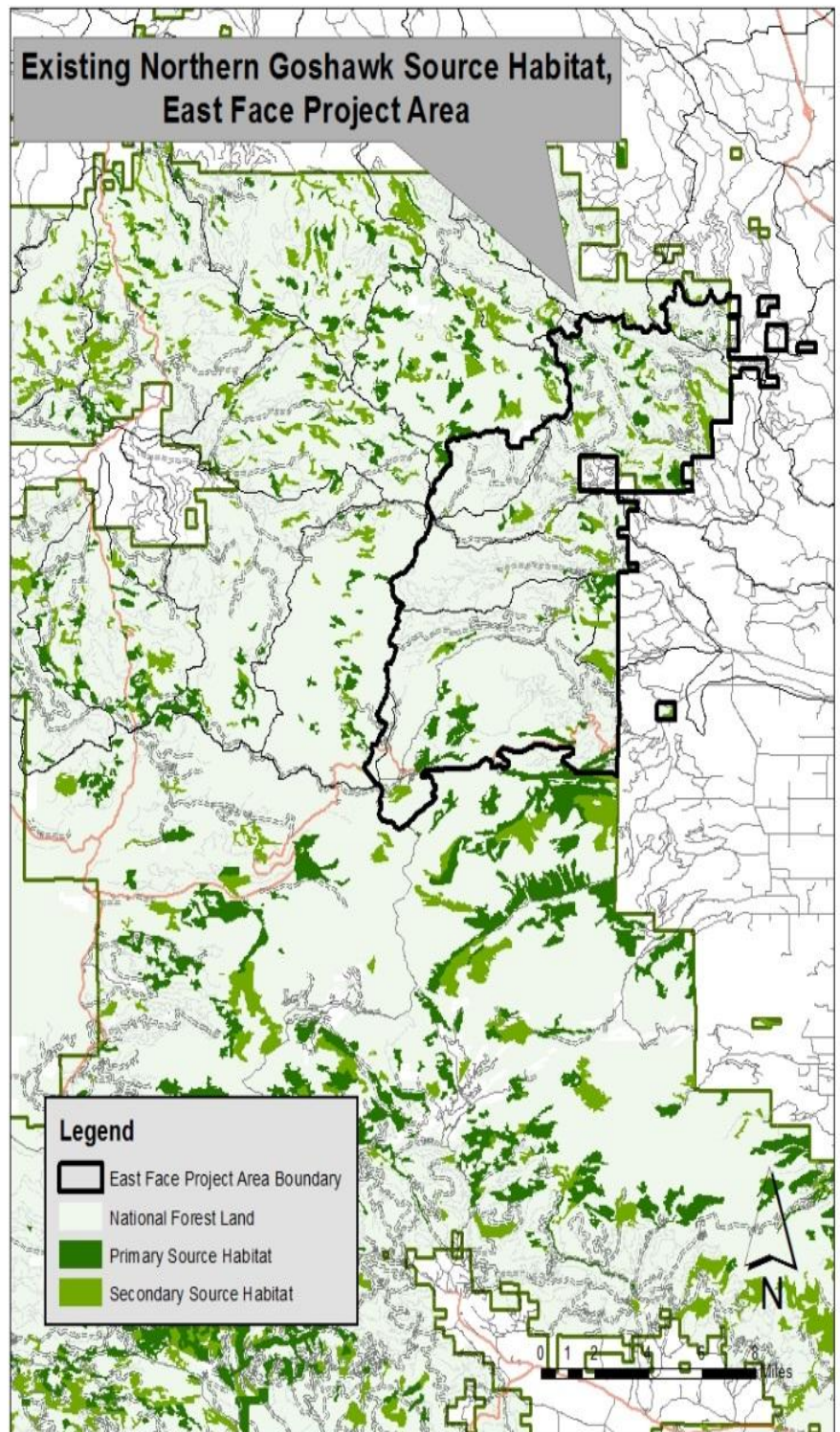
Wolf Creek/Powder River Watershed

The northern portion of the East Face project area lies within the Wolf Creek/Powder River watershed (5th HUC). This watershed contains 2,289 acres of existing goshawk source habitat (habitat that can support a stable or increasing population of northern goshawks) out of 13,226 acres (17%) of potential habitat. The current watershed index is 2.30 and the historical watershed index is 2.94, indicating a high level of habitat quality and quantity both currently and historically. The weighted watershed index is 2,132 indicating that this watershed provides a low contribution to goshawk population viability on the forest. This watershed currently provides $\geq 40\%$ of the median amount of source habitat that occurred historically, which is above the threshold necessary to support goshawk population viability (Penninger and Keown 2011b).

Figure 3 - Existing goshawk source habitat within the East Face Project Area

Grande Ronde River/ Beaver Creek Watershed

A portion of the north-western part of the project area lies within the Grande Ronde River/Beaver Creek Watershed. (5th HUC). This watershed contains 7,956 acres of existing



goshawk source habitat (habitat that can support a stable or increasing population of northern goshawks) out of 53,051 acres (15%) of potential habitat. The current watershed index is 2.48 and the historical watershed index is 2.94, indicating a high level of habitat quality and quantity both currently and historically. The weighted watershed index is 7,981, indicating that this watershed provides a medium contribution to goshawk population viability on the forest. This watershed currently provides $\geq 40\%$ of the median amount of source habitat that occurred historically, which is above the threshold necessary to support goshawk population viability (Penninger and Keown 2011b).

North Powder River Watershed

The southern portion of the East Face project area lies within the North Powder River watershed (5th HUC). This watershed contains 9,361 acres of existing goshawk source habitat (habitat that can support a stable or increasing population of northern goshawks) out of 41,811 acres (22%) of potential habitat. The current watershed index is 2.84 and the historical watershed index is 2.94, indicating a high level of habitat quality and quantity both currently and historically. The weighted watershed index is 10,759, indicating that this watershed provides a medium contribution to goshawk population viability on the forest. This watershed currently provides $\geq 40\%$ of the median amount of source habitat that occurred historically, which is above the threshold necessary to support goshawk population viability (Penninger and Keown 2011b).

East Face project area

Northern goshawk source habitat was assessed for the East Face analysis area using four variables; potential vegetation group, canopy closure, number of canopy layers and tree size, as defined in the Northern Goshawk Management Indicator Species Assessment (Penninger and Keown 2011). Potential vegetation groups include dry ponderosa pine, dry Douglas-fir, dry grand fir, cool moist upland forests, and cold dry upland forests. Canopy closure is generally greater than 40% in the dry vegetation types and greater than 60% in the cool and cold types. Canopy layers included both single and multi-story and tree size is defined as 15 inches dbh or greater. A GIS query found 4,958 acres of primary northern goshawk habitat (10% of the project area) (Figure 3). Audio callback transects were conducted June-August 2014 along 7 transects in identified goshawk source habitat. One goshawk was detected in the northern part of the project area.

Effects

Direct/Indirect Effects for Northern Goshawk

ALTERNATIVE 1

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Assuming no wildfires or disease/insect outbreaks, goshawks and their prey would likely continue to benefit from dense stands. Existing good goshawk habitat would be at risk if the project area is left untreated because existing OFMS and

MA15 could be lost to wildfire and/or disease and insect outbreaks. If an uncharacteristic disturbance occurred, the condition of habitat for the goshawk and its prey would likely decline due to a loss of canopy cover and structural diversity, and then slowly improve over the long-term. The loss of over story cover would represent a long term reduction. Existing levels of snags and down wood would be at risk from uncharacteristic wildfire. The impact to goshawk habitat would depend on the size and severity of the disturbance.

ACTION ALTERNATIVES

Commercial

Both commercial treatments and fuels treatments, including prescribed fire would occur in northern goshawk source habitat under all alternatives (Table 11). Alternatives 2, 4 and 5 propose three types of commercial treatments within identified goshawk source habitat: Harvest fuels, improvement, and shelterwood treatments. Improvement and harvest fuels treatments are expected to simplify structure and reduce canopy cover. Trees over 21 inches dbh and snags over 12 inches dbh and down wood would be maintained according to Forest Plan standards (See Decayed wood section). These types of treatments are expected to reduce certain habitat elements, such as core nest site characteristics of high canopy cover but are not expected to keep the habitat from being used by goshawks for other life history functions. Goshawk are prey generalists and forage in a variety of habitats, ranging from mature forests to open habitat adjacent to forested lands (Beier & Drennan 1997) and treated stands are expected to still provide foraging habitat.

Alternatives 2, 4, and 5 also propose 26 acres of a shelterwood treatment within goshawk source habitat. A shelterwood treatment removes the majority of trees in a stand in order to establish a new cohort of trees. Scattered overstory trees are retained to provide shade and site protection. As with all treatments, no trees over 21 inches dbh and no snags over 12 inches dbh will be removed. While goshawks potentially could use this area for foraging, the shelterwood harvest would degrade goshawk habitat more than other treatments and it would not be considered goshawk habitat until the new cohort of trees entered a late successional structural stage. All harvest treatments are expected to increase average stand diameter due to removal of trees primarily in smaller size classes, and sustainability of habitats is expected to increase as stand density reductions lower the risk of disturbance such as stand-replacement fire, especially in dry forest types.

Non-commercial

All action alternatives propose non-commercial fuel reduction treatments. These treatments are designed to remove ladder fuels and manage understory tree density by removing trees less than 9 inches dbh, pruning on some leave trees and piling of thinning slash and natural fuels concentrations. These treatments do not affect overall canopy cover or remove large trees but will simplify stands in the short term (15-20 years). These treatments will leave the habitat in source habitat condition and may improve foraging habitat. Foraging sites are typically characterized by open space between the bottom of the canopy and the top of the shrub layer and some authors have speculated that this space may increase prey availability by providing a flight path for foraging goshawks (Beier & Drennan 1997, Widen 1989).

Alternative 3 reduces the amount of commercial and non-commercial treatments in goshawk source habitat and does not propose any shelterwood treatments (Table 11). This Alternative impacts the least amount of goshawk source habitat. Alternative 5 proposes to commercially treat 12% of source habitat and non-commercially treat 20% of source habitat found in East Face. This Alternative would impact the greatest amount of goshawk source habitat.

In addition to impacts to available habitats, each action alternative poses potential for direct impact to nesting individuals. Both timber harvest and prescribed fire could cause individual harassment or mortality if operations destroy a nest tree occupied by young of the year. If goshawk nesting is discovered prior to, or during implementation, a no activity nest area of at least 30 acres will be designated for active nests. Goshawks were detected at one site during summer 2014 field reconnaissance and follow up surveys will be conducted through implementation of treatments to determine if goshawks are nesting. If a nest tree is identified, the proper treatment restrictions will be enforced (30 acres no treatment zone around nest tree).

Table 11 - Comparison of affected goshawk habitat by Alternative (acres). Percentages below indicate affected percentage of identified goshawk source habitat.

Treatment Type	Acres/ Percent Habitat	Alternatives				
		1	2	3	4	5
Commercial treatments	Acres		538	276	411	601
	Percent Habitat	0	11%	6%	8%	12%
Non-commercial treatments	Acres		959	817	1,121	972
	Percent Habitat	0	19%	16%	23%	20%
Total affected acres	Acres		1,497	1,093	1,532	1,573
	Percent Habitat	0	30%	22%	31%	32%

Cumulative Effects for Goshawks

ALTERNATIVE 1

There are no cumulative effects to goshawks from this alternative.

ACTION ALTERNATIVES

Cumulative effects for goshawks were analyzed at the Wolf Creek Powder River and North Powder River watershed scale. Past, present and reasonably foreseeable future actions were analyzed for cumulative impacts to the species. Effects of past activities including road construction, fire suppression, prescribed fire, woodcutting and timber management on WWNF lands have been incorporated into the existing conditions for amounts and locations of marten habitat in the analysis area.

Precommercial thinning work is proposed within the Wolf Creek Powder River watershed during 2015-2016 and is expected to have minimal impact on marten as it will reduce understory structure, and maintain canopy closure. Commercial treatment and fuel reduction treatments within the Elkhorn Wildlife Area will have an impact on goshawk habitat as canopy cover will be reduced and stand structure will be simplified. Timber harvest on private inholdings is expected to continue at some level, with anticipated reduction of trees larger than 10 inches dbh, and goshawk habitat within the National Forest will become more important as habitat is reduced on private lands.

Conclusion

Existing goshawk source habitat on the WWNF as modeled by Wales (2011) totals 440,696 acres. As a result of projected habitat reduction under the East Face project, source habitats at the Forest-level would decline by less than 0.3 percent under all action alternatives. Cluster analysis used to describe existing distribution of source habitats across the WWNF indicates that these habitats are well distributed across the Forest (Penninger and Keown 2011).

Because this project impacts less than 0.3% of source habitat across the Forest under all alternatives, the overall direct, indirect and cumulative effects will result in a small negative effect to goshawk habitat. The loss of habitat will be insignificant at the scale of the WWNF. Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the Wolf Creek Powder River, the Grande Ronde River/Beaver Creek and North Powder River watershed under all action Alternatives, thereby continuing to contribute to habitat distribution and species viability on the WWNF.

III. Pileated Woodpecker

Background Information

The pileated woodpecker (*Dryocopus pileatus*) occurs primarily in dense mixed-conifer forest in late seral stages or in deciduous tree stands in valley bottoms. It is occasionally seen in younger stands lacking large diameter trees, particularly in winter. It is rarely found in stands of pure ponderosa pine. The association with late seral stages stems from the need for large diameter snags or living trees with decay for nest and roost sites, large diameter trees and logs for foraging on ants and other arthropods, and a dense canopy to provide cover from predators (Marshall et al. 2003).

In northeast Oregon, the pileated woodpecker shows high selection for mature, unlogged grand fir stands with $\geq 60\%$ canopy closure, multiple canopy layers, and high snag density (Bull and Meslow 1988, Bull 1987, Bull and Holthausen 1993). Bull et al. (2007) found that densities of nesting pairs of pileated woodpeckers were positively associated with the amount of late structural stage forest and negatively associated with the amount of area dominated by ponderosa pine and the amount of area with regeneration harvest. Although there is a preference for dense canopy stands, high tree mortality and loss of canopy closure in stands of grand fir and Douglas-fir did not appear to be detrimental to pileated woodpecker provided that large dead or live trees and logs were abundant and that stands were not subject to extensive harvest. Pileated woodpecker densities remained steady over 30 years in areas where canopy cover dropped below 60% due to tree mortality; older stands of grand fir and Douglas-fir consisting primarily of snags continued to function as nesting, roosting and foraging habitat for pileated woodpeckers. While closed canopy forests were not essential for use by pileated woodpeckers, nest success was higher in home ranges that had greater amounts of forested habitat with $\geq 60\%$ canopy closure (Bull et al. 2007).

Pileated woodpeckers feed primarily on insects in dead wood in snags, logs, and naturally created stumps (Bull and Meslow 1988, Bull et al. 1986, Torgersen and Bull 1995). Based on research data compiled in the DecAID Wood Advisor (Mellen-McClean et al. 2012) for eastside

mixed conifer forests, 70% of pileated woodpeckers in the populations studied used snags > 12.9 in. dbh for foraging. Stands with high density of snags and logs were preferred for foraging (Bull and Meslow 1977).

Viability Determination

Habitat trends of the pileated woodpecker were assessed at the Interior Columbia Basin, Blue Mountains ecological reporting unit (ERU), and WWNF scales using information provided by Wisdom et al. (2000) and the species viability assessment conducted by Wales (2011) in support of the Blue Mountains Forest Plan revision.

A fine-scale analysis of source habitat on National Forest lands in the Blue Mountains, including the WWNF was conducted in 2011 (Penninger and Keown 2011c). This analysis indicated that there has been a decline in the amount of source habitat on the WWNF from historical conditions. However, source habitat of the pileated woodpecker is still available in adequate amounts and distribution to maintain pileated species viability on the WWNF. Currently, there are approximately 206,374 acres (57% of historical condition) of source habitat on the WWNF, with twenty-nine of the thirty-five watersheds (83%) on the WWNF that historically provided source habitat, continuing to provide that habitat. Reductions of snags and the presence of roads has decreased the quality of source habitat in many watersheds but 33% of the watersheds on the WWNF have high watershed index scores, indicating good habitat abundance, moderate to high snag densities and low to moderate road densities. Additionally, 29% of the watersheds are in the moderate category. Watersheds having $\geq 40\%$ of the median amount of source habitat are distributed across the WWNF and found in all clusters.

The viability assessment indicates the WWNF still provides for the viability of the pileated woodpecker. The pileated woodpecker is distributed across the WWNF and there are adequate amounts, quality, and distribution of habitat to provide for pileated woodpecker population viability.

Existing Condition

Wolf Creek- Powder River Watershed

The northern portion of the East Face planning area lies within the Upper Wolf Creek subwatershed of the Wolf Creek-Powder River watershed (5th HUC). This watershed contains 833 acres of existing pileated source habitat (habitat that can support a stable or increasing population of pileated woodpeckers) out of 13,120 acres (6%) of potential source habitat. The current watershed index is 0.76 and the historic watershed index is 2.63 indicating a high level of habitat quality and quantity historically and a low level of habitat quality and quantity presently. The weighted watershed index is 257, indicating the watershed provides a low contribution to pileated woodpecker population viability on the forest. This watershed does not provide $\geq 40\%$ of the median amount of source habitat that occurred historically. Based on the amount of existing source habitat, it is estimated that this watershed has the potential to support one breeding pair of pileated woodpeckers (Penninger and Keown 2011c).

Grande Ronde River/ Beaver Creek Watershed

A portion of the north-western part of the project area lies within the Grande Ronde River/Beaver Creek Watershed. (5th HUC). This watershed contains 3,266 acres of existing pileated source habitat (habitat that can support a stable or increasing population of pileated woodpeckers) out of 48,697 acres (0.07%) of potential source habitat. The current watershed index is 0.83 and the historic watershed index is 2.63 indicating a high level of habitat quality and quantity historically and a low level of habitat quality and quantity presently. The weighted watershed index is 1,098, indicating the watershed provides a low contribution to pileated woodpecker viability on the forest. This watershed provides $\geq 40\%$ of the median amount of source habitat that occurred historically, which is above the threshold to support a stable population of pileated woodpeckers. Based on the amount of existing source habitat, it is estimated that this watershed has the potential to support 4 breeding pairs of pileated woodpeckers (Penninger and Keown 2011c).

North Powder River Watershed

The southern portion of the East Face planning area lies within the Anthony Creek and portions of the Antone Creek drainages in the North Powder River watershed. This watershed contains 5,976 acres of existing pileated source habitat (habitat that can support a stable or increasing population of pileated woodpeckers) out of 41,731 acres (14%) of potential source habitat. The current watershed index is 1.97 and the historic watershed index is 2.63 indicating a high level of habitat quality and quantity historically and a medium level of habitat quality and quantity presently. The weighted watershed index is 4,776, indicating the watershed provides a medium contribution to pileated woodpecker viability on the forest. This watershed provides $\geq 40\%$ of the median amount of source habitat that occurred historically, which is above the threshold to support a stable population of pileated woodpeckers. Based on the amount of existing source habitat, it is estimated that this watershed has the potential to support 8 breeding pairs of pileated woodpeckers (Penninger and Keown 2011c).

East Face project area

Although pileated woodpeckers will use many habitat types, successful reproduction is thought to be tied to optimum habitat, which is typically Old Forest Multi Structure (OFMS). Pileated woodpecker source habitat was assessed for the East Face analysis area using four variables; potential vegetation group, canopy closure, number of canopy layers and tree size, as defined by Penninger and Keown (2011c). Potential vegetation groups include dry Douglas fir, dry grand fir, cool moist and cold dry. Canopy closure is generally greater than 40% in the dry vegetation types and greater than 60% in the cool and cold types. Canopy layers included both single and multi-story and tree size is defined as 20 in dbh or greater. Source habitat for pileated woodpeckers within the East Face analysis area is approximately 2,506 acres, (5%) of the project area (Figure 4). The project area does not provide a large contribution to pileated population viability within the watershed. Surveys during the 2014 field season consistently found pileated sign in dry and moist OFMS and OFSS stands. Two pairs of pileated woodpeckers were identified and the nest tree will be protected.

LRMP standards and guidelines

The LRMP requires that a 300-acre pileated feeding area be established in proximity to any patch of MA15 ≥ 300 acres and that at least 2 snags >10 inches dbh/acre be maintained within the feeding area. The Regional Forester's Eastside Forest Plan Amendment #2 (SCREENS) requires the maintenance of snags and GTR trees >21 inches dbh at 100% potential population levels; at least 2.25 snags/acre are needed after post-sale activities are completed to meet the 100% level. The SCREENS require a higher density of snags compared to the LRMP and, therefore, designation of a 300-acre pileated feeding area as identified in the LRMP is exceeded by SCREENS directions.

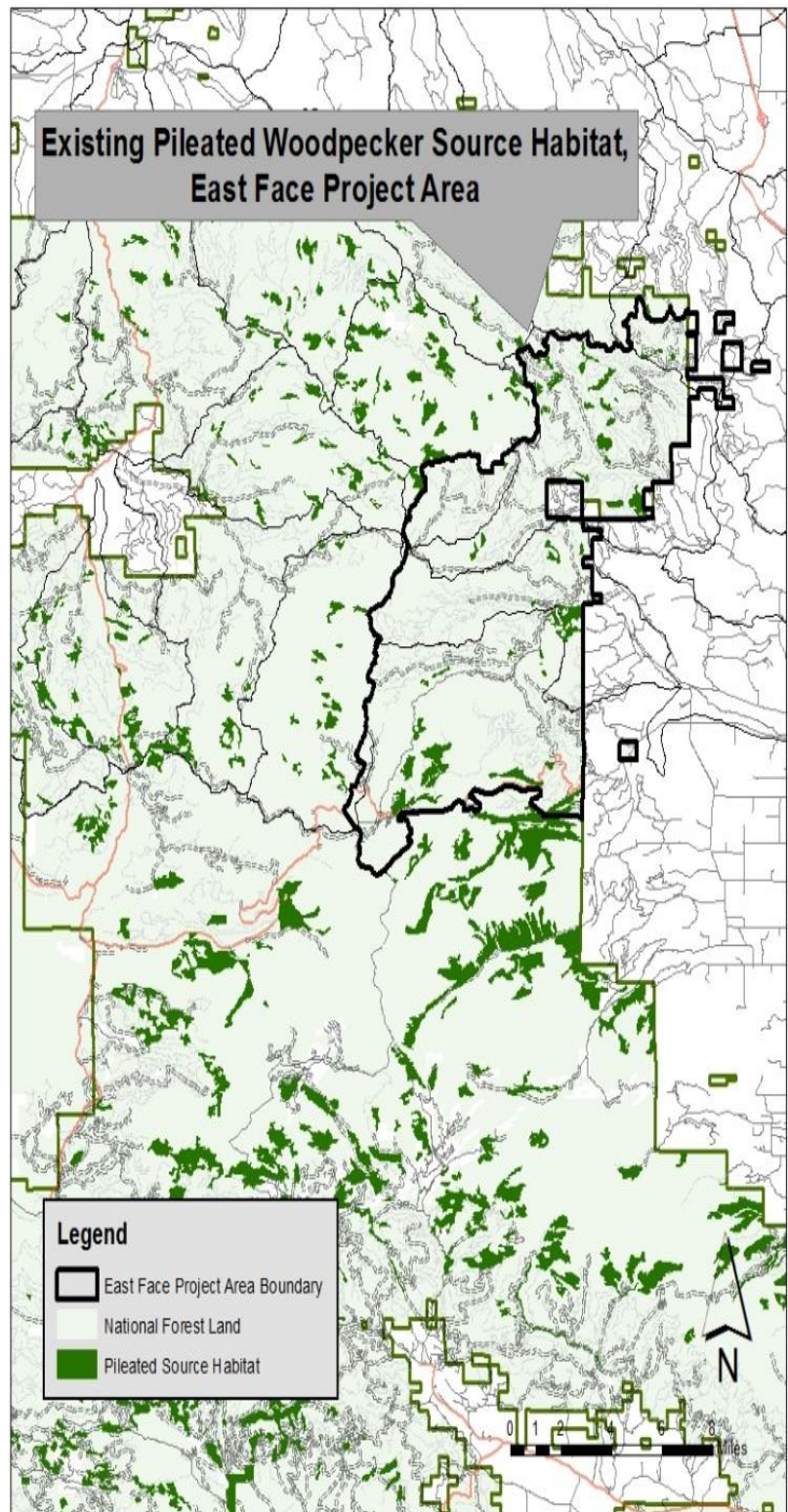
Figure 4 - Existing pileated woodpecker source habitat, East Face Project Area

Effects

Direct/Indirect Effects for Pileated Woodpecker

ALTERNATIVE 1

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Existing pileated habitat would be at risk if the project area is left untreated because existing old growth and MA15 could be lost to uncharacteristic wildfire and/or disease and insect outbreaks. Conversely, wildfire would likely also produce snags, but newly



created snags are usually hard and not easily excavated. Sound live trees that are killed by fire do not contain the rot and defects that exist in snags and logs die more slowly than from other causes. The impact to habitat would depend on the size and severity of the disturbance.

ACTION ALTERNATIVES

Both commercial and non-commercial treatments will take place in pileated woodpecker source habitat under all action alternatives (Table 12). Proposed commercial treatments common to all Alternatives are improvement treatments and harvest fuel treatments. Both of these types of treatments would impact canopy closure and would degrade the source habitat in the short term, however all trees >21 inches dbh and all snags >12 inches dbh would be retained. Non-commercial treatments simplify understory structure but are not expected to reduce canopy cover or move stands from their current structure stage and will not degrade pileated habitat. However, prescribed fire has the potential to reduce snag densities by burning snags and down logs and so could degrade the habitat. Alternative 2 has the least impact on pileated woodpecker source habitat (impacts 1% of the source habitat in the project area) compared to an impact of 2% from the other 3 Alternatives. Commercial and non-commercial treatments are expected to increase average stand diameter due to the removal of trees primarily in smaller size classes and improve habitat conditions in the long term. While long-term availability of total snag numbers may decrease, available snags will, on average, be larger in treatment areas compared to untreated areas. As discussed in the Snag and Log Habitat section, snags >10 inches dbh are well represented in all density classes within Ponderosa-Pine Douglas Fir and Eastside Mixed Conifer Wildlife Habitat Types, but large snags are limiting. Retention of all snags except for safety concerns minimizes the potential for direct impacts to nesting pileated woodpeckers.

Table 12 - Comparison of affected pileated woodpecker habitat by Alternative (acres). Percentages are affected percentage of identified pileated woodpecker source habitat.

Treatment Type	Acres/ Percent Habitat	Alternatives				
		1	2	3	4	5
Commercial treatments	Acres		43	43	22	55
	Percent Habitat	0	>0.1%	>0.1%	>0.1%	>0.1%
Non-commercial treatments	Acres		966	538	999	966
	Percent Habitat	0	2%	1%	2%	2%
Total affected acres	Acres	0	1,009	581	999	1,021
	Percent Habitat		2%	1%	2%	2%

Cumulative Effects for Pileated Woodpeckers

Cumulative effects for pileated woodpeckers were analyzed at the Wolf Creek Powder River, Grande Ronde River/ Beaver Creek and North Powder River watershed scale. Past, present and reasonably foreseeable future actions were analyzed for cumulative impacts to the species. Effects of past activities including road construction, fire suppression, prescribed fire, woodcutting and timber management on WWNF lands have been incorporated into the existing conditions for amounts and locations of pileated woodpecker habitat in the analysis area.

Precommercial thinning work is proposed within the Wolf Creek Powder River watershed during 2015-2016 and is expected to have minimal impact on pileated woodpeckers as it will reduce

understory structure, and maintain canopy closure. Precommercial thinning would reduce stress on overstory trees, creating less future snags, however model runs have shown these treatments lead to higher average diameters within stands and on average, larger snags. Commercial treatment and fuel reduction treatments within the Elkhorn Wildlife Area will have an impact on pileated habitat as canopy cover will be reduced and stand structure will be simplified, though commercial treatments are expected to result in larger snags in the long term (50+ years). Timber harvest on private inholdings is expected to continue at some level, with anticipated reduction of trees larger than 10 inch dbh, and snag removal and pileated habitat within the National Forest will become more important as habitat is reduced on private lands.

Conclusion

Alternative 5 would have the greatest impact on pileated woodpecker source habitat by proposing 1,021 acres of commercial and non-commercial treatment. Existing pileated woodpecker source habitat on the WWNF as modeled by Wales (2011) totals 129,943. As a result of East Face project activities, 0.7% of pileated source habitat across the forest would be impacted in the medium term (30-50 years). Cluster analysis is used to describe existing distribution of source habitats across the WWNF and indicate that these habitats are well distributed across the Forest (Penninger and Keown 2011c).

Because this project impacts less than 0.7% of suitable habitat across the Forest under all Alternatives, the overall direct, indirect and cumulative effects will result in a small negative effect to pileated woodpecker habitat. The loss of habitat will be insignificant at the scale of the WWNF. Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the Wolf Creek Powder River and North Powder river watershed under all action Alternatives, thereby continuing to contribute to habitat distribution and species viability on the WWNF.

Snag and Log Habitat: Primary Cavity Excavators (PCEs)

Background information

More than 80 species of wildlife use snags and living trees with defects (deformed limbs or bole, decay, hollow, or trees with brooms) in the interior Columbia River basin (Bull et al. 1997). The Blue Mountains of Oregon have 39 bird and 23 mammal species that use snags for nesting or shelter (Thomas 1979).

PCEs rely heavily on decadent trees, snags, and down woody material and can be used as an indicator species of snag habitat. These birds; common flicker (*Colaptes auratus*); Lewis' (*Melanerpes lewis*), hairy (*Picoides villosus*), downy (*Picoides pubescens*), white-headed (*Picoides albolarvatus*), black-backed (*Picoides arcticus*), three-toed (*Picoides tridactylus*), northern three-toed (*Picoides tridactylus bacatus*), and pileated (*Dryocopus pileatus*) woodpeckers; yellow-bellied (*Sphyrapicus varius*) and Williamson's sapsuckers (*Sphyrapicus thyroideus*); black-capped (*Parus atricapillus*), chestnut-backed (*Poecile rufescens*), and mountain chickadees (*Poecile gambeli*); and white-breasted (*Sitta carolinensis*), red-breasted (*Sitta Canadensis*), and pygmy (*Sitta pygmaea*) nuthatches, depend on snags for nesting and roosting, and snags and down wood for foraging. A key assumption is if habitat is provided for

PCEs, then habitat requirements for secondary cavity users will be met. Suitable nest sites are often considered the limiting factor for cavity nesting bird populations. Habitat for the white-headed woodpecker, and other species such as western bluebirds, was once quite common on the east side of the Cascade Mountains, but years of fire exclusion, along with selectively harvesting large old pine trees has greatly reduced this habitat to well below historic levels.

Thinning and prescribed burning may be needed to restore habitat and increase bird numbers. In one study, white-headed woodpeckers were not observed in any untreated forest stands during 3 years of monitoring (Okanogan and Wenatchee National Forests, Cascade Lookout newsletter 2006). These same treatments are also successful in reducing the risk of high severity fire in these stands. Many PCEs, and secondary cavity nesters, feed on forest insects and play a vital role in maintaining healthy, productive forests. Large snags and trees provide more functions, for more species, for a greater period of time than smaller ones. Large woody structures are not easily or quickly replaced. Down woody material is an important component of the forest ecosystem because of its role in nutrient cycling and immobilization, soil productivity, and water retention (Johnson and O'Neil 2001). It also provides habitat for mycorrhizal fungi, invertebrates, reptiles, amphibians, and small mammals. For these reasons emphasis should be placed on conserving or creating these structures when carrying out forest management practices. There is increasing pressure on snag and log habitat as logging safety restrictions and firewood gathering intensify.

LRMP standards

LRMP direction is to maintain snags and green tree replacement trees of ≥ 21 inches dbh, or whatever is the representative diameter of the overstory layer if it is < 21 inches dbh, at 100% potential population levels of primary cavity excavators (U.S. Forest Service 1995). The LRMP used information from Wildlife Habitats in Managed Forests (Thomas et al. 1979; at least 2.25 snags > 20 in dbh per acre) to establish minimum snag guidelines. The model Thomas et al. (1979) used to generate snag densities addressed snags for roosting and nesting, but did not consider snags for foraging, and was never scientifically validated. More recently, several studies have shown these snag densities are too low to meet the needs of many primary and secondary cavity users (Bull et al. 1997, Harrod et al. 1998, Korol et al. 2002). Consequently, the original standards for snags and down wood from Thomas et al. (1979) were replaced with the Regional Forester's Forest Plan Amendment #2 (U.S. Forest Service 1995). Bull et al. (1997) found the 2.25 snags/acre insufficient and that 4 snags/acre (2.8 are between 10-20 inches dbh and 1.2 are > 20 inches dbh) is more appropriate as a minimum density required by primary and secondary cavity users for roosting, nesting, and foraging needs. Harrod et al. (1998) determined a range of historic snag densities for dry eastside forests between 5.9-14.1 snags/acre (5-12 are between 10-20 inches dbh and 0.9 to 2.1 are > 20 inches dbh). Korol et al. (2002) determined that HRV for large snags (20 inches dbh) for dry eastside mixed conifer forest with a low intensity fire regime was 2.9 to 5.4 snags/acre.

Direction from the Eastside Screens requires that pre-activity levels of logs be left unless those levels exceed those shown in Table 13. Live green trees of adequate size must also be retained to provide replacements for snags and logs through time. Generally green tree replacements (GTRs) need to be retained at a rate of 25 to 45 trees per acre, depending on biophysical group.

Pre-activity levels of logs should also be left unless levels exceed amounts specified in Amendment #2 (U.S. Forest Service 1995; Table 5). Larger blowdowns with intact tops and root wads are preferred to shorter sections of tree boles.

Table 13 - LRMP standards for down wood¹ (U.S. Forest Service 1995).

Stand type	Pieces/acre ¹	Piece length	Diameter small end	Linear ft/acre
Ponderosa Pine	3-6	> 6'	12"	40'
Mixed conifer	15-20	> 6'	12"	140'
Lodgepole Pine	15-20	> 8'	8"	260'

¹ The table converts to about 0.4, 1.7, and 3.3 tons/acre for ponderosa pine, mixed conifer, and lodgepole pine,

The Decayed Wood Advisor (DecAID)

Integration of the latest science is incorporated into this analysis using DecAID Advisor (version 2.2) (Mellen-McLean et al. 2012) which is an internet-based summary, synthesis, and integration (a "meta-analysis") of the best available science: published scientific literature, research data, wildlife databases, forest inventory databases, and expert judgment and experience. In addition to data showing wildlife use of dead wood, DecAID also contains data showing amounts and sizes of dead wood across the landscape based on vegetation inventory data.

Data from unharvested plots are assessed separately and these data can be used as a reference condition to approximate HRV of dead wood. There is debate among professionals on the impact fire exclusion has on stands relative to HRV of dead wood. One caveat to using these data is, "On the eastside in particular, current levels of dead wood may be elevated above historical conditions due to fire suppression and increased mortality, and may be depleted below historical levels in local areas burned by intense fire or subjected to repeated salvage and firewood cutting" (Mellen-McLean et al. 2012). Even with this caveat, the data are used in this analysis because: they are still some of the best data available to assess HRV of dead wood, even in eastside dry forests; they are the only available data showing distribution and variation in snag and down wood amounts across the landscape; the data from unharvested stands are in the range of other published data on HRV of dead wood even in the drier vegetation types. For a full discussion see HRV Dead Wood Comparison (Mellen-McLean 2011).

A distribution analysis (<http://www.fs.fed.us/r6/nr/wildlife/decaid-guide/distribution-analysis-green-tree.shtml>) was used to determine how close current conditions for dead wood on the landscape match reference conditions. Existing conditions for dead wood were derived by using Gradient Nearest Neighbor (GNN) data (LEMMA). GNN produces pixel-based maps with associated snags. These maps provide the direct data necessary to construct "current situation" histograms. GNN uses the same data that were used to develop the distribution histograms for DecAID. For more information see Ohmann and Gregory (2002), and go to the following web site: <http://www.fsl.orst.edu/lemma/main.php?project=imap&id=home>.

The analysis area for the distribution analysis is larger than the project area and encompasses the Wolf Creek-Powder River and North Powder River watersheds. The larger analysis area was

needed to meet the minimum analysis area size of 12,800 acres per wildlife habitat type recommended by the authors of DecAID (Mellen-McLean et al. 2012).

The distribution analysis results are then compared to the needs of woodpecker species using tolerance levels and intervals (range between 2 tolerance levels) from DecAID. A tolerance interval is similar to the more commonly used confidence interval but with a key difference: tolerance intervals are estimates of the percent of all *individuals* in the population that are within some specified range of values. In comparison, confidence intervals are estimates of *sample means* from the population of interest. For more information see “What is a Tolerance Level?” (<http://www.fs.fed.us/r6/nr/wildlife/decaid/pages/What-is-a-tolerance-level.html>) and Marcot et al. 2010.

An example of use of a tolerance level is as follows. If the 50% tolerance level for snag density at pileated woodpecker nest sites in a specific wildlife habitat type is 7.8 snags/acre, the interpretation would be that 50% of nest sites used by pileated woodpeckers in that habitat have < 7.8 snags/acre and 50% of nest sites used by pileated woodpeckers have > 7.8 snags/acre.

Existing Conditions

The Eastside mixed conifer, montane mixed conifer, ponderosa pine, Douglas-fir and lodgepole pine wildlife habitat types occur in the analysis area. Results of the DecAID distribution analysis are displayed in Figures 5-8. Tolerance levels for woodpeckers are displayed in Tables 14- 16.

PPDF WHT- In the Ponderosa Pine/Douglas-fir wildlife habitat type (PPDF WHT), the landscape is near or above reference conditions for densities of large snags (>20”), and for snags >10 inches. There is less area lacking snags (0 snags/acre) than would be expected under reference conditions and more area in all other snag density classes, except for the 2-4 snag density class for large snags. Fires have burned enough of the landscape over the last decade that high densities of large snags occur on the landscape similar to what would have been expected under reference conditions. Most woodpecker species using this WHT should currently have an adequate amount of snag habitat on the landscape. The exception is those species using high densities of small snags in recent post-fire habitat (e.g., black-backed woodpecker). Large snag habitat for pileated woodpecker and Williamson’s sapsucker is rare in this wildlife habitat type both currently and with reference conditions.

EMC WHT- In the Eastside Mixed Conifer Wildlife Habitat Type (EMC WHT), the landscape is deficient in all snag density classes for large snags (>20”) compared to reference conditions except for the 0-2 density class. Snag density on the landscape still provides habitat above the 50% tolerance level for cavity-nesting birds in general. For snags >10 inches dbh, the landscape is above reference conditions in all snag density classes except the 24-36 snag/acre class. Snag habitat for most cavity-nesting birds should not be limiting in this area with the exception of those species using high densities of small snags in recent post-fire habitat. Though snag density levels provide habitat for pileated woodpeckers and Williamson’s sapsuckers at the 50% tolerance level, habitat may be limited to more productive sites in this WHT where snag densities are expected to be higher (Bull et al. 2007, Ohmann and Waddell 2002).

The amount of the landscape in the highest density classes for snags from unharvested stands (DecAID data) may be somewhat inflated due to an excess of dense stands with smaller trees susceptible to mortality than likely occurred historically. In addition, the data used in the calculation of reference conditions are from the late 1990s when spruce budworms were active in the Blue Mountains which created high levels of tree mortality. Lack of larger snags in this watershed/analysis area is also likely due to past management and firewood cutting.

MMC WHT- In the Montane Mixed Conifer Wildlife Habitat Type (MMC WHT), the landscape has become deficient in large snags (>20 ") at the 4-6 snags/acre density class and above compared to the reference condition. Conversely, the landscape contains excess small snags (>10") in the density classes 6-12 and above. This is likely due to fires that have burned in the landscape over the last decade creating areas with high densities of small snags. This portion of the landscape is providing habitat for those woodpeckers associated with post-disturbance habitats.

Concurrently, the lack of large snags in higher densities in this watershed is also likely due to past large wildfires that occurred approximately 60 years. The Anthony Lakes fire was a stand replacing fire and so the stands have yet to reach an age where large snags would be expected to be created in higher densities.

LP WHT- In the lodgepole pine wildlife habitat type the landscape is below reference condition for snags >10 inches in all density classes except for 0 snag/acre and the 0-6 snag/acre. Lodgepole pine very, very rarely grows above 20 inches and 12 inch dbh lodgepole is considered old-growth, so large trees within the lodgepole wildlife habitat type is not analyzed here. Lack of higher densities of lodgepole is most likely due to a combination of past management activities, past large fires and historic and current firewood cutting. Heavy harvest in the 1980's focused on lodgepole stands that had been infested with mountain pine beetle and these harvests removed many snags from the landscape. The Anthony Lakes burn occurred 60 years ago and reset the ages of many lodgepole stands. The stands that came in after the fire have not had enough time to reach the age where higher densities of snags would be expected. Firewood cutting in the area tends to concentrate on lodgepole snags because of their accessibility and high BTU.

Figure 5 - Comparison of reference condition to current condition for snag density classes in the PPDF WHT portion of the East Face analysis area. Figure A displays snags >20" dbh; figure B displays snags >10" dbh. 50% tolerance levels for wildlife species are displayed on both figured. Reference condition derived from DecAID unharvested vegetation plots in the Blue Mountains; wildlife tolerance levels from Tables PPDF_S/L.sp-22 and PPDF_PF.sp-22 (Mellen-McLean et al. 2012) Current conditions from GNN data.

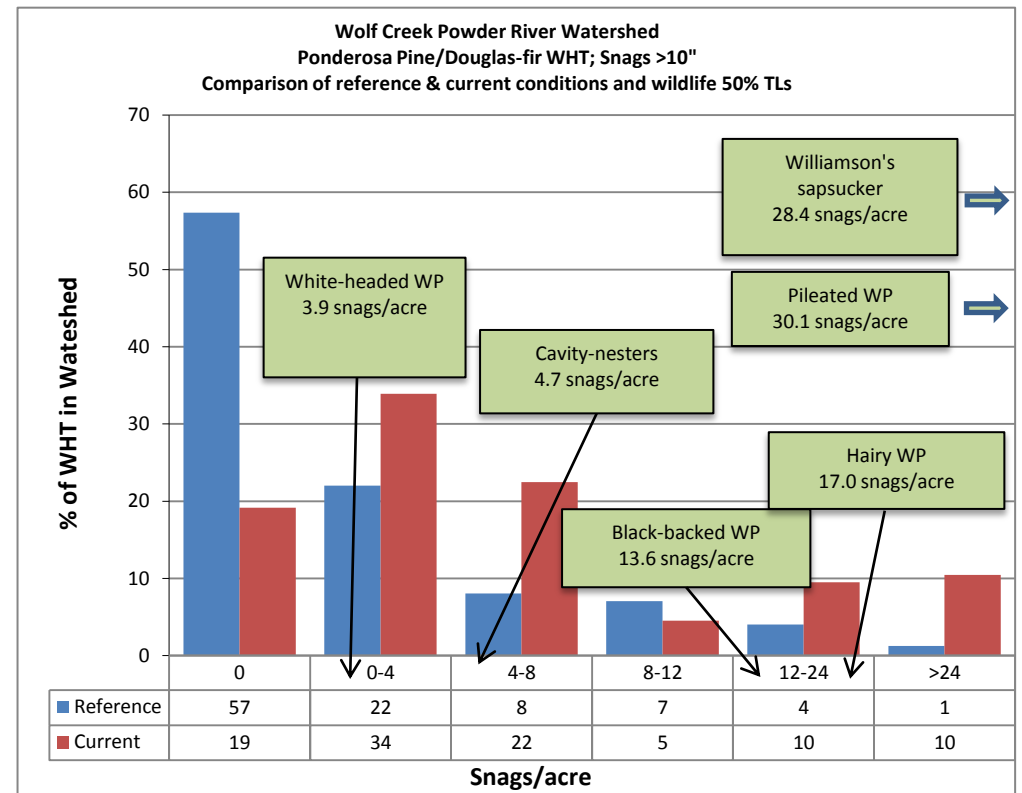
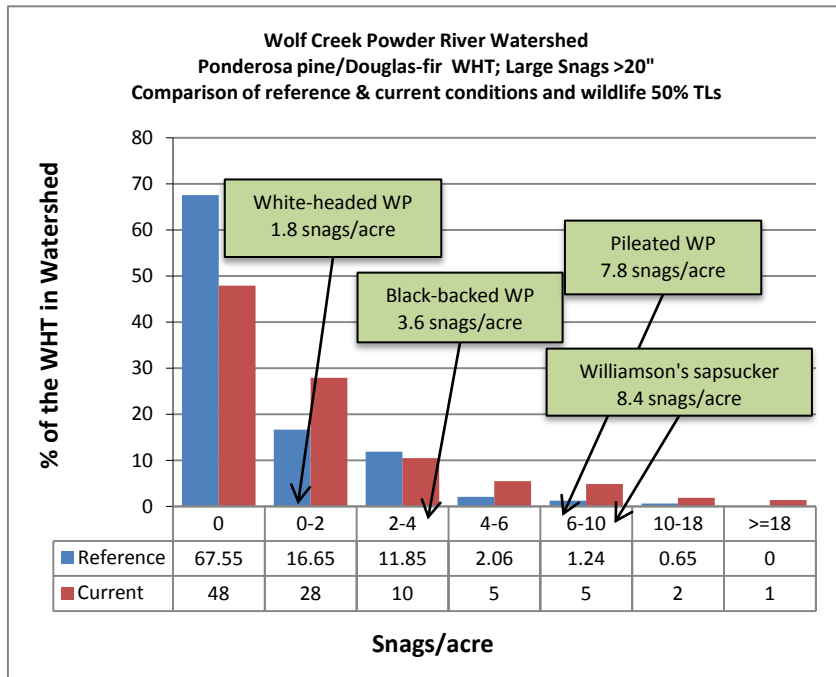


Table 14 - Tolerance levels for woodpeckers occurring in the PPDF Wildlife Habitat Type (From DecAID Tables PPDF_S/L.sp-22 and PPDF_PF.sp-22)

Species	Snag density/acre for 30%, 50%, 80% tolerance levels	
	>10" dbh	>20" dbh
White headed woodpecker	0.3, 3.9, 11.9	0.5, 1.8, 3.8
Pygmy nuthatch	1.1, 5.6, 12.1	
Black-backed woodpecker	2.5, 13.6, 29.2	0.0, 1.4, 5.7
Williamson's sapsucker	14.0, 28.4, 49.7	3.0, 8.4, 16.3
Pileated woodpecker	14.9, 30.1, 49.3	3.3, 8.6, 16.6

Figure 6 - Comparison of reference condition to current condition for snag density classes in the EMC WHT portion of the East Face Analysis Area. Figure A displays snags > 20" dbh; figure B displays snags > 10" dbh. 50% tolerance levels for wildlife species are displayed on both figures. Reference condition derived from DecAID unharvested vegetation plots in the Blue Mountains (see analysis file); wildlife tolerance levels for green stands and post-fire habitat from Tables EMC_S/L.sp-22 and EMC_PF.sp-22 (Mellen-McLean et al. 2012). Current conditions from GNN data (see analysis file).

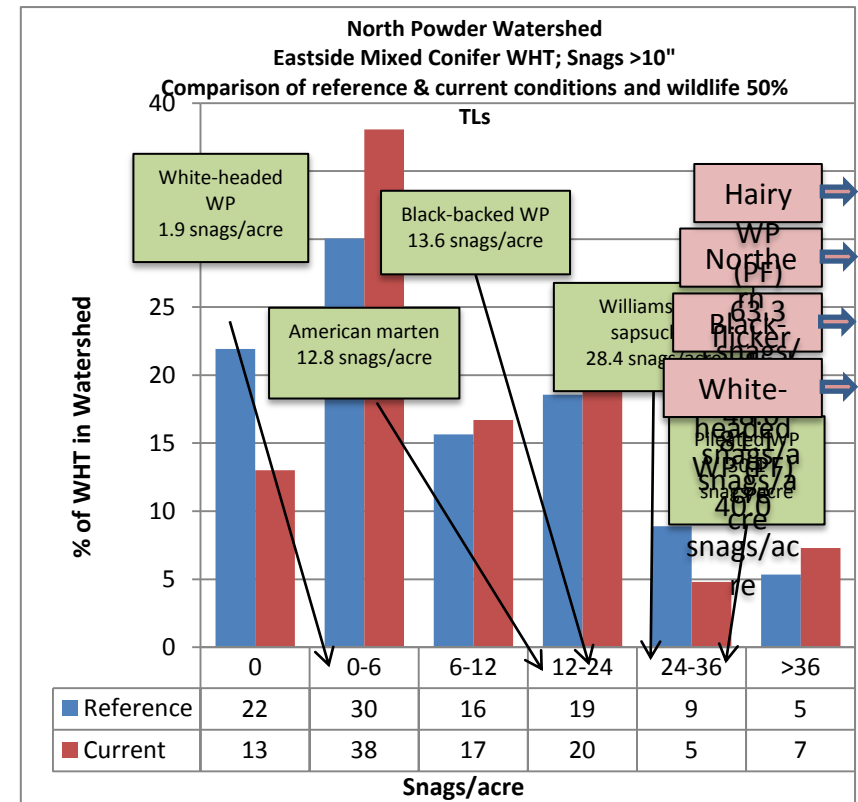
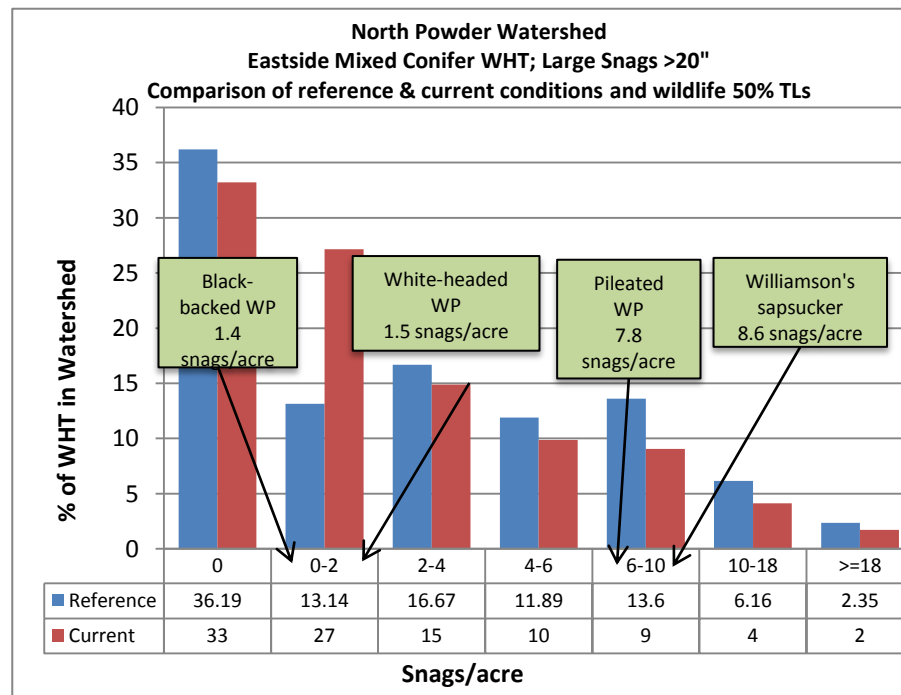


Table 15 - Tolerance levels for woodpeckers occurring in the PPDF Wildlife Habitat Type (From DecAID Tables EMC_S/L.sp-22 and EMC_PF.sp-22)

Species	Snag density/acre for 30%, 50%, 80% tolerance levels	
	>10" dbh	>20" dbh
White headed woodpecker	0.3, 3.9, 11.9	0.5, 1.8, 3.8
Pygmy nuthatch	1.1, 5.6, 12.1	
Black-backed woodpecker	2.5, 13.6, 29.2	0.0, 1.4, 5.7
Williamson's sapsucker	14.0, 28.4, 49.7	3.0, 8.4, 16.3
Pileated woodpecker	14.9, 30.1, 49.3	3.3, 8.6, 16.6

Figure 7 - Comparison of reference conditions to current condition for snag density classes in the MMC WHT portion of the East Face Analysis Area. Figure A displays snags > 20" dbh; figure B displays snags > 10" dbh. Reference condition derived from DecAID unharvested vegetation plots in the Blue Mountains (see analysis file). Current conditions from GNN data (see analysis file).

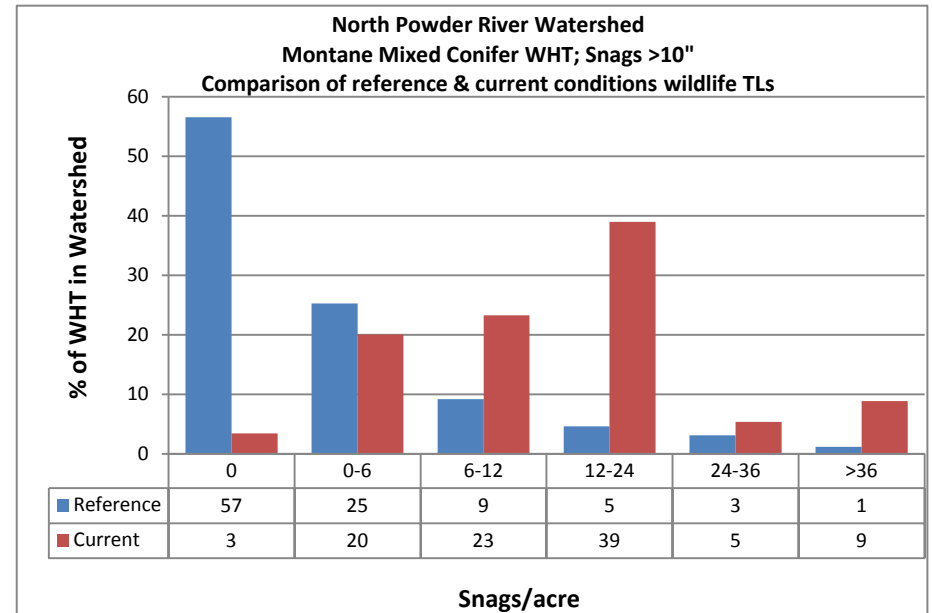
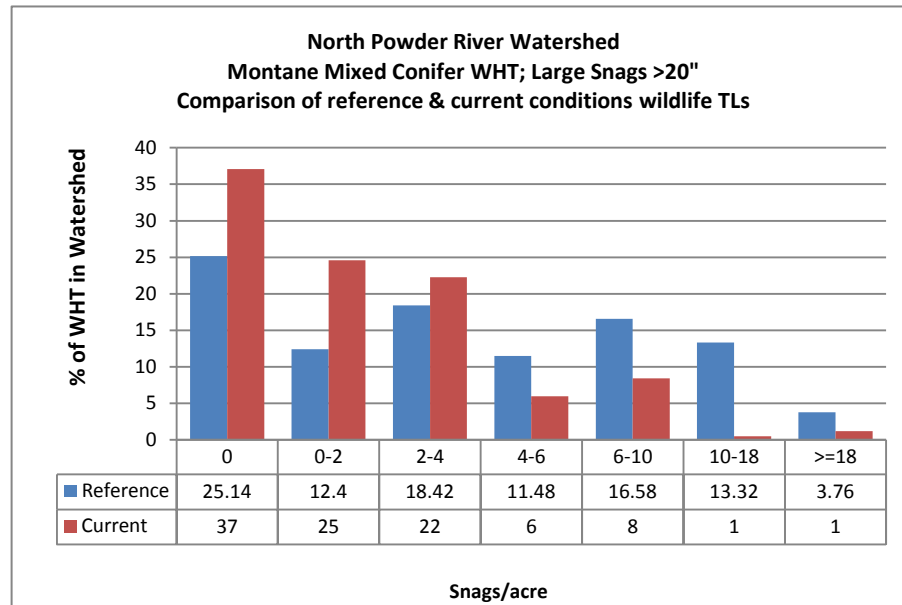
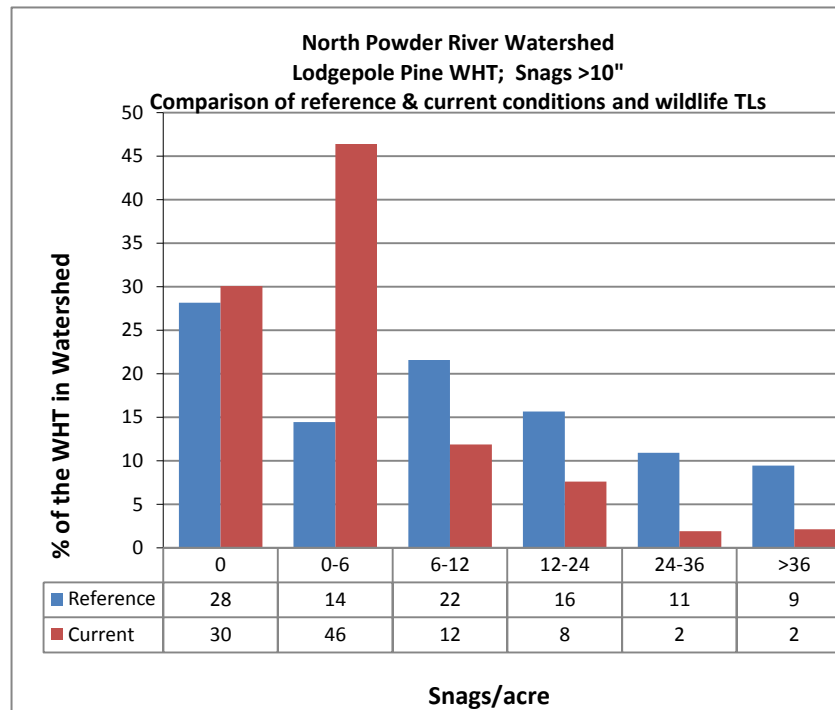


Table 16 - Tolerance levels for woodpeckers occurring in the MMC Wildlife Habitat (From DecAID Tables MMC_S/L.sp-22 and MMC_PF.sp-22)

Species	Snag density/acre for 30%, 50%, 80% tolerance levels	
	Green Forests	Recent Post-fire, $\geq 3"$ dbh
Black-backed woodpecker		41.6, 78.9, 134.0
Northern three-toed woodpecker		44.2, 71.5, 111.8
Williamson's sapsucker		10.8, 28.0, 51.8

Figure 8 - Comparison of reference conditions to current condition for snag density classes in the LP WHT portion of the East Face Analysis Area. Figure A displays snags $> 20"$ dbh; No snag density data are available in DecAID for woodpeckers in the Lodgepole Pine wildlife habitat type. Reference condition derived from DecAID unharvested vegetation plots in the Blue Mountains (see analysis file). Current conditions from GNN data (see analysis file).



Down wood- Based on field reconnaissance (summer/fall 2014), down wood in all size classes (0 - 0.25 inch, 0.25 - 1 inch, and >3 inch) is common throughout the project area and the Wolf Creek/Powder River and North Powder River watersheds, indicating the total volume of down wood exceeds LRMP standards. Within the watershed the cold upland forest types contain (<30 tons/acre fuel loads), the dry upland forest types contain (< 20 tons/acre fuel loads), and the moist upland forest types contain (>30 tons/acre fuel loads).

Retention of downed logs is based on Amendment #2. DecAID provides estimates of percent cover of downed wood. The existing down wood data is in tons per acre. A direct conversion to percent cover tolerance levels is not possible without the length of the logs and diameter, and this data is not available. However, estimates of post project down wood based on field reconnaissance exceed LRMP standards.

Effects

Assumptions

The direct, indirect, and cumulative effects analysis area for snag and log habitat management indicator species is the Wolf Creek-Powder River and North Powder River watersheds. The larger analysis area was needed to meet the minimum analysis area size of 12,800 acres per wildlife habitat type recommended by the authors of DecAID (Mellen-McLean et al. 2012).

The duration of effects are discussed when relevant or practical to predict. The following timeframes will apply for the purpose of this analysis. These timeframes are appropriate given the scale of this analysis and the duration of effects expected from the prescribed treatments.

Short term	0 – 20 years
Mid term	20 - 50 years
Long term	50 - 100 years

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on dead and defective habitat management indicator species.

- Road decommissioning
- Temporary road construction & Road reconstruction
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement

These activities and their effects will not be discussed further in the effects to snag and log habitat indicator species sections below.

Direct/Indirect Effects – Snag and Log Habitat

ALTERNATIVE 1

This alternative retains the most snag habitat in the short-term and mid-term to the degree that snags would not be reduced for operational reasons, or consumed during prescribed burning as in the action alternatives.

Stands containing larger structure trees would continue to provide snag and down wood habitat to meet habitat requirements of primary cavity nesters at least through the short-term (15-25 years). In the absence of stand replacement fires, down wood levels would continue to increase. Stands within the analysis area that were logged in the early 1990s would begin to provide snag habitat in the long-term. Tree mortality in overstocked stands will increase fuel loadings, increasing the likelihood of stand replacement fires. This would benefit species like black-backed and hairy woodpeckers in the short term, but would reduce or eliminate habitat for pileated, white-headed, and downy woodpeckers less associated with fire.

ACTION ALTERNATIVES

Non-commercial

Project activities will not remove any snags >12 inches except when they pose a danger to personnel. Non-commercial fuels treatments are not expected to negatively affect snag densities; though in the long-term pre-commercial thinning is expected to provide larger snags, similar to commercial thinning. Snags that are lost in prescribed burns are often replaced with new snags from trees killed during the fire. Proposed fuels activities (removing small trees, retaining large trees, prescribed burning) are expected to help create habitat for PCEs using open forests with large trees in the long-term and reduce habitat for those PCEs using dense forests.

Prescribed burning creates a period of reduced “soft snag” habitat that persists into the early mid-term. This can cause wildlife species that depend on such structures, such as pileated woodpeckers, to move to other areas in search of suitable habitat, resulting in lower productivity and reduced local populations. Although burning would likely reduce the densities of snags and logs, the burn plan is designed to protect large snags. The function of snag and log habitat in the analysis area is not likely to be compromised by burning given the considerations that are built into the prescription; the lighting pattern would be designed to protect large diameter snags. Fire would also likely create new snags and logs to replace some of the small to medium diameter material that may burn. However, newly created snags and logs are usually hard and not easily excavated. Burning creates a period of reduced “soft snag” habitat that persists into the short and early mid-term. This can cause wildlife species that depend on such structures to temporarily move to other areas in search of suitable habitat, resulting in lower productivity and reduced local populations. Alternatives 2, 4 and 5 propose approximately 6,600 acres of prescribed burning. Alternative 3 proposes slightly less at 6,000 acres.

Commercial

Five different types of commercial treatments are proposed for the East Face project area that are expected to affect future recruitment of snags. Six models were run using the Forest Vegetation Simulator (FVS) looking at different treatments on different stands in the dry, moist and cold forest types to see the effects to snags comparing no treatment and treatment after 30 and 50 years (Table 17).

All commercial treatments will reduce the density of snags on the landscape in the short and the long-term (Table 17). Treatments are designed to improve the health of the stand, reducing competition, insect and disease mortality which in turn reduces snag recruitment. After 30 years a treated area has a range of 9-28 snags/acre as opposed to 16-76 snags/acre in an untreated area, and after 50 years a range of 7-35 snags/acre is found in treated areas compared to 20-70 snags/acre in untreated areas. These ranges in the treated areas still meet the minimum thresholds for primary cavity excavators (See Figures 5-8) and still meet forest plan standards for ecologically appropriate numbers. With treatment, snag size tends to be larger than without treatment. The average dbh of snags in treatment areas after 30 years is 11.2 inches as opposed to 8.8 inches dbh. Fifty years after treatment the average dbh in treated stands is 12 inches dbh compared to an average dbh of 10 inches in untreated stands. Treatments increase the growth rate of the remaining trees, thus increasing the amount of large trees in the mid to long-term, which will be beneficial to PCE's as large snags are limiting on the landscape in all wildlife habitat types except Ponderosa Pine/Douglas-Fir.

Each Alternative proposes differing amounts of commercial treatment and non-commercial treatments (Table 18). Alternative 5 proposes the highest amount of commercial treatments, 21% of the project area. This alternative would have the highest short-term negative effect on the overall density of snags in the project area but long-term would provide the greatest positive effect on large snag recruitment. Alternative 4 proposes the least amount of commercial treatments, 6% of the project area. This Alternative would have the least short-term negative effect on the overall density of snags in the project area, but would also have the lowest positive effect on large snag recruitment. All alternatives would maintain snag levels above forest plan standards and provide habitat for PCE's at least at the 50% TL.

Table 17 - Comparison of effects of 5 different commercial treatments on snag recruitment in treated and untreated stands 30 and 50 years after treatment.

UNIT	PVG	STRUC	RX	EXISTING CONDITION				NO TREATMENT- 30 YEARS				TREATMENT- 30 YEARS				NO TREATMENT- 50 YEARS				TREATMENT- 50 YEARS			
				#/AC	MIN DBH	MAX DBH	AVG DBH	#/AC	MIN DBH	MAX DBH	AVG DBH	#/AC	MIN DBH	MAX DBH	AVG DBH	#/AC	MIN DBH	MAX DBH	AVG DBH	#/AC	MIN DBH	MAX DBH	AVG DBH
1	MOIST	UR	HIM	5	0.7	19.0	11.1	16	1.5	21.9	9.9	9	1.0	30	13.5	20	2.5	21.9	12.0	8	2.9	30.0	14.3
2	MOIST	UR	HSH	116	1.0	25.2	5.5	76	1.0	22.6	8.6	22	1.4	25.7	11.9	60	1.0	22.6	9.2	35	1.8	25.7	7.4
3	MOIST	UR	HPR	5	0.7	19.0	11.1	61	2.1	15.3	6.6	5	3.5	8.9	5.8	51	2.9	13.6	7.4	7	4.6	17.0	8.3
4	DRY	OFMS	HSA	0	0	0	0	68	0.9	28.4	7.2	22	1.0	27.7	14.0	70	1.4	32.6	7.9	19	1.9	27.6	13.5
5	MOIST	UR	HTH	51	1.0	27.0	11.2	32	2.3	27.0	13.4	23	3.3	29.6	13.8	28	3.1	33.0	15.3	15	4.7	34.0	17.1
6	DRY	SE	PCT	9	2.0	26.5	6.2	51	3.3	21.1	7.1	28	2.0	21.1	8.2	40	3.3	21.1	8.5	35	6.2	31.7	10.5

Table 18 - Comparison of proposed commercial and non-commercial treatments between Alternatives. Percentage is percent of project area

Treatments	Measure	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Commercial	Acres % Project Area	0	6,722 14%	3,879 8%	2,844 6%	10,221 21%
Non-commercial	Acres % Project Area	0	10,376 22%	9,775 20%	13,656 29%	7,815 16%
Total Commercial/ Non-Commercial	Acres % Project Area	0	17,098 36%	13,654 29%	16,500 35%	18,036 38%
Prescribed Fire	Acres % Project Area	0	6,685 14%	6,043 13%	6,643 14%	6,686 14%

Cumulative Effects on Snag and Log Habitat

The list of past, present and foreseeable actions was reviewed to determine potential effects to dead and defective wood habitat and considered the Wolf Creek Powder River and North Powder River watershed. Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF and BLM lands have been incorporated into the existing condition. Firewood cutting will continue to reduce available snags and logs, but the effect is limited to areas adjacent to open roads. Roads that are temporarily open for harvest activities will temporarily increase firewood cutting activities and snag densities in those areas will go down, though it is illegal to take snags > 21 inch dbh. Precommercial thinning activities from the Ladd Canyon TSI project (expected activities in 2015-2016) and on adjacent private lands would not directly affect current snag levels but are expected to reduce future snag densities and increase average snag diameter while still maintaining Forest Plan snag standards. Commercial and fuel reduction treatments in the Elkhorn Wildlife Area (expected activities in 2015) would also reduce snag densities but would result in larger snag diameters in the long term. Timber harvest on private inholdings is expected to continue at some level, with anticipated reductions of trees larger than 10 inches dbh and snag densities are expected to decline.

Conclusion

Current availability of snags in the project area indicate deficiencies in large snag densities within the Eastside Mixed Conifer and Montane Mixed Conifer Wildlife Habitat Types, though habitat remains for all species at the 50% tolerance level. All proposed activities are consistent with Forest Plan and BLM Resource Management Plan standards and guidelines pertaining to primary cavity excavators. Timber harvest and prescribed burning under all action alternatives have the potential to decrease snag densities, but that impact is expected to be minor within the project area and on the landscape as a whole due to snag retention requirements.

Harvest treatments will result in lower levels of green tree recruitment, but recruitment levels meet Forest Plan standards as well as exceed recommendations from more recent research (Bull 1997, Harrod 1998, Korol 2002). Stand density treatments in conifer stands are expected to enhance habitats for Lewis' woodpecker, white-headed woodpecker, northern flicker, pygmy nuthatch, white-breasted nuthatch, and Williamson's sapsucker green tree habitats. Although treatments would improve habitats for these species within the project area, the effect to habitats Forest-wide would be minor considering that the project area encompasses only 2% of the WWNF acres. Proposed tree density reduction treatments would reduce risk to insect and wildfire disturbance on up to 18,036 acres within the project area, thereby reducing the potential for future pulses of habitat suitable for Lewis', hairy, and black backed woodpeckers within a large portion of the project area, although currently habitat exists.

Alternative 5 proposes the highest amount of commercial treatments, by managing 21% of the project area. This alternative would have the highest short-term negative effect on the overall density of snags in the project area but long-term would provide the greatest positive effect on large snag recruitment. Alternative 4 proposes the least amount of commercial treatments, 6% of the project area, having the least short-term negative effect on the overall density of snags in the

project area, but would also have the lowest positive effect on large snag recruitment. No alternative considered for the East Face project would affect population trends or viability for primary cavity excavator species at the Forest level.

Neotropical Migratory Bird Species

Background Information-

A migratory bird is defined by the Migratory Bird Treaty Act of 1918 as any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle. They are a large group of species, including many hawks (*Buteo sp.*), shorebirds (*Charadriiformes*), flycatchers (*Muscicapidae sp.*), vireos (*Vireonidae sp.*), swallows (*Hirundinidae sp.*), thrushes (*Turdidae sp.*), warblers (*Parulidae sp.*), and hummingbirds (*Trochilidae sp.*), with diverse habitat needs spanning nearly all successional stages of most plant community types. Nationwide declines in population trends for migratory species, especially neotropical species, have developed into an international concern. Recent analyses of local and regional bird population counts, radar migration data, and capture data from banding stations show that forest-dwelling bird species, have experienced population declines in many areas of North America (Finch 1991). Habitat loss is considered the primary reason for declines. Other contributing factors include fragmentation of breeding grounds, deforestation of wintering habitat, and pesticide poisoning.

The U.S. Fish and Wildlife Service (FWS) is the lead federal agency for managing and conserving migratory birds in the United States; however under Executive Order (EO) 13186 all other federal agencies are charged with the conservation and protection of migratory birds. In response to this, the Forest Service has implemented management guidelines that require the Forest Service to address the conservation of migratory bird habitat and populations when developing, amending, or revising management plans (Executive Order 13186, 2001). To aid in this effort, the USFWS published *Birds of Conservation Concern 2008 (BCC 2008)*. The overall goal of the report is to accurately identify the migratory (and non-migratory) bird species that represent the high conservation priorities. BCC 2008 uses current conservation assessment scores from three bird conservation plans: Partners in Flight North American Landbird Conservation Plan (PIF; Rich et al. 2004), the United States Shorebird Conservation Plan (USSCP; Brown et al. 2001, USSCP 2004), and the North American Waterbird Conservation Plan (NAWCP, Kushlan et al. 2002).

Bird Conservation Regions (BCRs) are used to separate ecologically distinct regions in North American with similar bird communities, habitats, and resource management issues. Species contained within the BCC are identified for each BCR. The La Grande District and majority of the Wallowa-Whitman National Forest (WWNF) is found within BCR-10, Northern Rockies.

Existing Conditions

BCR-10 includes the Northern Rocky Mountains and outlying ranges in both the United States and Canada, and also the inter-montane Wyoming Basin and Fraser Basin. The Rockies are dominated by a variety of coniferous forest habitats. Drier areas are dominated by ponderosa pine, with Douglas-fir and lodgepole pine at higher elevations and Engelmann spruce and

subalpine fir even higher. More mesic forests to the north and west are dominated by eastern larch, grand fir, western red cedar and western hemlock. Five migratory species of conservation concern have been identified as potentially occurring within the project area (Table 19). No formal surveys have been conducted specifically for any of these species within the East Face analysis area, although terrestrial birds were monitored in the Blue Mountains from 1994-2011 as part of the U.S. Forest Service Avian Monitoring Program (Huff and Brown 2006), as well as multiple annual breeding bird survey route through the La Grande and Baker districts (Sauer et al. 2011).

Table 19 - Migratory species of conservation concern identified within the East Face analysis area

Focal Species	Key Habitat Relationships		
	Vegetative	Vegetation Structure	Special Considerations
Dry Forest			
White-headed woodpecker	Ponderosa pine	Large patches of old forest with large trees and snags	
Flammulated owl	Ponderosa pine, Douglas-fir	Old forest with grassy opening and dense thickets	Thicket patches for roosting; grassy openings for foraging
Chipping sparrow	Ponderosa pine, Douglas-fir, grand fir	Open understory with regenerating pines	Non-agricultural/grazing landscape due to cowbird parasitism
Lewis' woodpecker	Ponderosa pine	Patches of burned old forest	Soft snags for excavation; pesticide spraying may reduce prey base
Moist Mixed Conifer Forest			
Vaux's swift	Grand fir, douglas-fir	Large snags	Recruitment snags (live trees) with signs of defect; proximity to riparian areas
Townsend's warbler	Grand fir, douglas-fir	Overstory canopy closure	
Varied thrush	Grand fir, douglas- fir	Structurally diverse; multi-layered	Area sensitive; avoids edges; needs dense leaf litter for foraging
MacGillivray's warbler	Douglas-fir	Dense shrub layer in forest openings and understory	Cowbird host; extensive grazing detrimental
Olive-sided flycatcher	Grand fir, ponderosa pine	Edge and openings created by fire	Patches of mix of live and dead
Subalpine Forest			
Hermit thrush	Spruce-fir	Patches of subalpine forest with multi-layered structure and dense understory shrub layer	Livestock grazing can reduce understory density; species shows lower abundance in treated stands

Dry Forests

Dry forests in relation to migratory bird species are described as coniferous forests composed exclusively of ponderosa pine or dry stands codominated by ponderosa and Douglas fir or grand fir (Altman 2000). Large-scale declines in open stands, especially those with large trees, have raised concern for such species as the white-headed woodpecker, flammulated owl, white-breasted nuthatch, pygmy nuthatch, Williamson's sapsucker, and Lewis' woodpecker. 19% of the East Face project area consists of Dry Forests.

Moist mixed conifer Forest

Moist mixed conifer forests in relation to migratory bird species are described as consisting primarily of cool moist Douglas-fir/grand fir, cool dry Douglas-fir, western larch, hemlock, and occasional ponderosa pine. This habitat does not include sites that were historically ponderosa pine but have transitioned to mixed conifer due to fire suppression and encroachment of other conifers. Approximately 40% of the East Face project area consists of moist mixed conifer forests.

Effects

Assumptions

The direct, indirect, and cumulative effects analysis area for neotropical migratory bird species is the East Face project area.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on dead and defective habitat management indicator species.

- Roadside hazard tree removal
- Closed roads reopened for administrative access
- Road decommissioning
- Temporary road construction & Road reconstruction
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement
- Mechanical Control Lines for Burning

These activities and their effects will not be discussed further in the effects to Neotropical Bird species sections below.

Direct/Indirect Effects – Neotropical Migratory Bird Species

ALTERNATIVE 1

Current conditions would persist under Alternative 1. Activities including timber harvest, prescribed fire, and transportation activities would not occur. Stand conditions would remain denser than those estimated to have existed historically in warm and dry forest types, with elevated risk of stand replacement fire.

ACTION ALTERNATIVES

Timber harvest and prescribed burning treatments conducted during the primary nesting season present the potential for direct impacts to neotropical birds nesting in stands proposed for treatment. Potential direct effects include individual mortality or displacement from nests during treatment. The degree of impact varies by alternatives and is best correlated with the number of acres treated with Alternative 5 treating the most acres in dry and moist mixed conifer forests followed by Alternative 2, Alternative 3 and Alternative 4 respectively.

Commercial

The Partners in Flight Conservation Strategy applicable to the Blue Mountains (Altman 2000) described dry forest habitat as among the most reduced habitat types in the Interior Columbia Basin with dry OFSS reduced by 96% in the Blue Mountains. The Conservation Strategy stresses the importance of restoring open single-storied stands with large trees for conserving associated land bird species. All action alternatives would increase available OFSS habitat. Alternative 2 and Alternative 5 generate the largest benefit for species dependent upon open forest with large trees by increasing available dry OFSS by 7% across the project area. Alternative 3 would increase dry OFSS by 6% and Alternative 4 would increase dry OFSS by 4% (Table 18).

The Partners in Flight Conservation Strategy selected late-successional mixed mesic conifers a priority habitat due to substantial losses in the ecoregion as a result of past timber harvest, primarily regeneration harvests. Treatments in Alternative 2 and Alternative 5 would reduce moist OFMS by 1% across the project area and negatively affect neotropical migrants that require high canopy closure and complex stands (Townsend's warbler, varied thrush). Species that prefer shrub layer in openings and edges caused by wildfire within moist mixed conifer, like the Olive-sided flycatcher are assumed to benefit from treatments within moist forests. However Robertson and Hutto (2007) found that commercial vegetation treatments seem to create ecological traps for olive-sided flycatchers in particular. Densities of flycatchers within created habitat increased, but nesting success was half of what was expected compared to control areas that had burned in natural wildfire. Based on this, it can be assumed that commercial treatments, while mimicking habitat for the olive-sided flycatcher, would have a negative effect on them with Alternative 2 and 5 have the greatest effect.

Conversely Alternative 2 and 5 will treat a greater amount of understory reinitiation stands, setting the condition for future moist OFMS. Alternatives 3 and 4 would not affect the percentage of OFMS found within the project area but forego opportunities to increase future OFMS by treating existing UR stands.

All Alternatives propose treatments within subalpine forests and would have a negative effect on subalpine specific species (hermit thrush). Alternatives 2, 4 and 5 would reduce cold OFMS by 1% across the project area. Though Alternative 3 proposes treatments in the subalpine forests, treatments are so limited that they would not affect the percentage of subalpine forest found within the project area.

Non-commercial

The spring prescribed burning season on the WWNF normally occurs from mid-April to the end of May. Fall prescribed burning generally occurs from October 1 through early November. The

prescribed fire program has generally consisted of burning an estimated 50% of acres in the spring and 50% of acres within the fall period. Applications from April through mid-May are unlikely to impact the majority of nesting birds of concern. However, prescribed burning during and after the latter portion of May has the potential to directly impact nests and individuals, primarily young of the year. Sallabanks (no date) described the onset of ground-nesting birds as occurring after spring vegetation leaf-out and recommended completion of spring burning prior to leaf-out. Therefore, design features have been incorporated into the project that require district wildlife biologists review of prescribed burning that extends past May, as well as passive lighting and means of reducing potential for consumption of larger snags.

Prescribed fire presents both negative impacts and benefits to dry forest conditions by potentially creating and removing (consuming) snags, maintaining openings, and removing dense understory conifer thickets and developing shrub layers. Application of passive lighting near snags during prescribed burning would reduce the potential for consumption of snags. Down logs would be maintained at or above levels prescribed in the Eastside Screens. None of the treatments would remove patches of burned forest, but silviculture and prescribed fire reduce the potential for burned habitat within the project area. Duration of effects due to density reduction is expected to last 10-30 years.

For cavity nesting species, retention of snags except for safety reasons mitigate the risk of direct impact to these species.

All action alternatives propose silviculture treatments that would restore aspen where found, thereby providing localized benefits for aspen dependent species.

Table 20 – Comparison of Old Growth stand structure to HRV after proposed treatments

Structure/PVG	HRV	Existing	Alternatives				
			1	2	3	4	5
OFMS- Moist	15-20%	12%	12%	11%	12%	12%	11%
OFMS- Dry	5-15%	10%	10%	4%	5%	6%	4%
OFMS- Cold	10-25%	16%	16%	16%	16%	16%	16%
OFSS- Moist	10-20%	0.14%	0.14%	0.7%	0.14%	0.4%	0.7%
OFSS- Dry	40-60%	3%	3%	10%	9%	7%	10%
OFSS- Cold	5-20%	2%	2%	3%	2%	3%	3%

Cumulative Effects for Neotropical Bird Species

Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF lands have been incorporated into the existing condition. Livestock grazing is expected to continue within the analysis area. Habitat improvements afforded by the action alternatives for chipping sparrow may also increase access of areas to livestock and brown-headed cowbirds. The potential for increase in nest parasitism is expected to be most pronounced in areas adjacent to existing cattle operations and agriculture on private lands along the southern boundary of the project area.

Timber harvest on adjacent private lands is expected to continue, with little availability of late and old forest structure and large snags anticipated. Therefore, habitat on National Forest lands will be increasingly important as habitat on private lands is reduced.

Conclusion

All action alternatives have the potential to directly impact neotropical migratory bird species (NTMBs), due to potential nest tree removal during the nesting season. The level of impact is unknown, but potential is highest for Alternatives 2 and 5, and less for Alternative 4 and 3 respectively. The no-action alternative removes direct impacts to NTMBs but maintains habitat conditions that favor high-density forest stands that may not be sustainable in the long-term. Implementation of mitigation factors reduces the potential for direct impacts to nesting land birds.

The action alternatives increase dry forest habitats by restoring single-story structure, thereby benefiting land birds associated with this habitat type. Alternatives 2 and 5 would restore the largest amount of dry forest habitat. Alternatives 3 and 4 also restore habitat, but at slightly lower amounts in comparison to Alternatives 2 and 5.

All action alternatives would decrease available moist OFMS with Alternative 2 and 5 removing the most and Alternative 3 and 4 removing less. Alternative 2 and 5 will remove 1% of moist OFMS from the project.

All action alternatives have the potential to increase nest parasitism by opening up forest stands and increasing available forage for livestock. Overall, with implementation of project design features, the project is consistent with managing dry forest habitats as well as maintaining existing mixed mesic late-successional habitat. Effects of stand treatments are expected to last 10-30 years.

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